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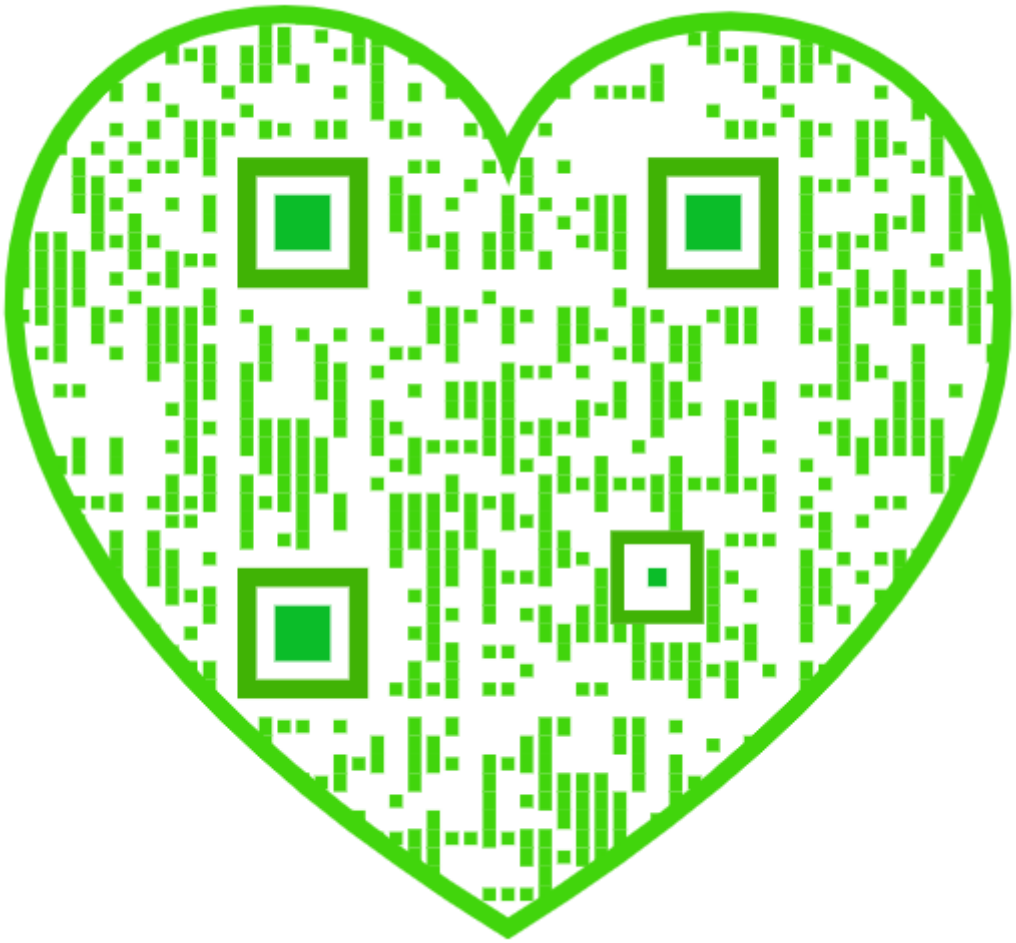
How to Raise

Fruits.



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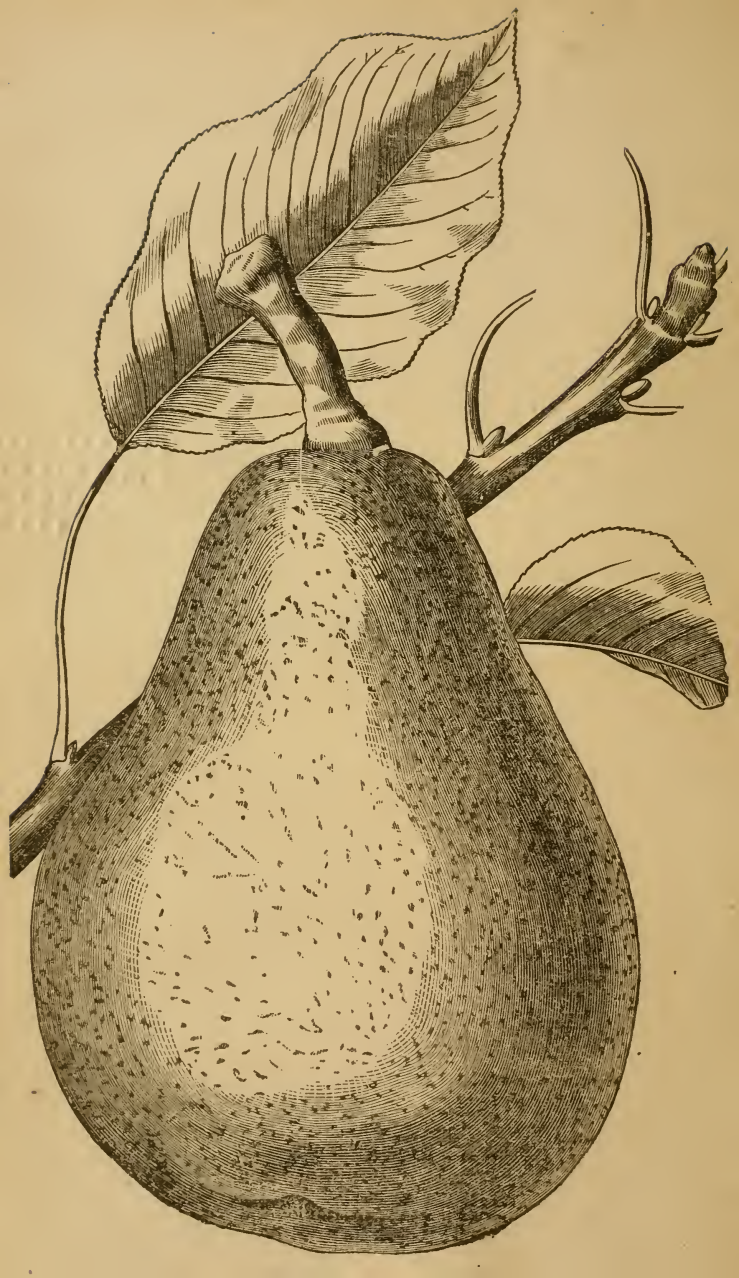

HOW TO RAISE FRUITS.

A HAND-BOOK

OF

FRUIT CULTURE,

BEING A GUIDE TO THE PROPER

Cultivation and Management of Fruit Trees,

AND OF

GRAPES AND SMALL FRUITS,

WITH

CONDENSED DESCRIPTIONS OF MANY OF THE BEST AND MOST POPULAR VARIETIES.

By THOMAS GREGG.

FULLY ILLUSTRATED.

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PREFACE.

THE spirit said "Write!" And I wrote. The result is before the reader. If it shall be of any service to him—well; if not—WELL.

But there is hope that this little book—imperfect and faulty as a just criticism may find it to be—will be of some service to the fruit-eating and fruit-producing public. If it shall in any wise aid those who don't now know how to choose, to plant, to cultivate, and to use the fruits of the earth, which the beneficent Creator has so bounteously bestowed upon us, it will have fulfilled the mission designed for it by

THE AUTHOR.

27866

CONTENTS.

PART I.

Fruit Culture in General.

CHAPTER I.—INTRODUCTORY REMARKS.

PAGE

1. The free use of Fruit as a common article of Food will greatly contribute to the Health of the People. 2. Fruit is a cheap article of Food. 3. The culture of good Fruit is profitable. 4. Fruit furnishes an amount of good living not otherwise attainable. 5. There is economy in the use of Fruit 9

CHAPTER II.—PRELIMINARIES TO PLANTING.

Cost—Estimate for three Acres—Distances—Location—Soil—Preparation of the Ground—Manuring..... 17

CHAPTER III.—TRANSPLANTING.

Laying off the Ground—Season for Transplanting—Taking from the Nursery—Selection of Trees—Setting out Trees—Trimming 24

CHAPTER IV.—AFTER-CULTURE.

Plowing and Hoeing—Pruning—Protection—Mulching 27

PART II.

Kinds of Fruit.

CHAPTER I.—THE ALMOND..... 30

CHAPTER II.—THE APRICOT..... 32

CHAPTER III.—THE APPLE..... 34

CHAPTER IV.—THE BLACKBERRY 72

CHAPTER V.—THE CHERRY 77
CHAPTER VI.—THE CURRANT 83
CHAPTER VII.—THE GOOSEBERRY 86
CHAPTER VIII.—THE QUINCE 89
CHAPTER IX.—THE NECTARINE 93
CHAPTER X.—THE PEACH 95
CHAPTER XI.—THE PEAR 103
CHAPTER XII.—THE PLUM 119
CHAPTER XIII.—THE RASPBERRY 127
CHAPTER XIV.—THE STRAWBERRY 137
CHAPTER XV.—THE GRAPE 148
CHAPTER XVI.—CLOSING WORDS 171
APPENDIX 175

PART I.

FRUIT CULTURE IN GENERAL.

Chapter One.

INTRODUCTORY REMARKS.

Somebody has said that he who causes two blades of grass to grow where but one grew before, is a public benefactor. So, he who makes a tree grow where none grew before, gladdening the wayfarer with the fragrance of its blossoms and the richness of its fruit, performs an act not only of public beneficence, but of private good.

That every farmer—and, indeed, every head of a family so situated as to be able to do so—should possess a Fruit Orchard, more or less extensive, is a proposition so apparent as to admit of no controversy. There are few owners of land in the country, and comparatively few in the cities and towns, but might, by the exercise of a little prudence and forethought, provide themselves with an amount of rich and wholesome fruit sufficient for their own consumption. There ought to be ten times—yea, a hundred times—as much fruit consumed in the United States as at present. What is now brought sparingly within the reach of the few, should be used plentifully by the many; instead of appearing only occasionally on the tables of the rich, it should form an important item of consumption with both rich and poor.

To aid in bringing about so desirable a result is the aim of the writer in the present publication. He makes the following points, as being eminently susceptible of demonstration:

I The Free Use of Fruit as a Common Article of Food will Greatly Contribute to the Health of the People.

This fact is now very generally conceded. Physicians and other writers on Hygiene agree that ripe fruits are among the most wholesome articles of diet, and that a much larger consumption of them, to the partial exclusion of the flesh of animals, would naturally improve the general health. Many quotations might be adduced in support of this position, but a few must suffice.

Dr. Kennicott, horticultural editor of the *Prairie Farmer*, at Chicago, and a man of much experience and observation, says:

"The free use of ripe fruits not only *prevents disease*, but their regulated enjoyment helps to remove that which already exists. All ripe fruits are more or less nutritious. Professor Salisbury has clearly demonstrated that the apple is superior to the potato in the principles that go to increase the muscle and the *brain* of man; and in fattening properties it is nearly equal, when cooked for swine or fed raw to other domestic animals."

A writer in Downing's *Horticulturist*, Sept., 1852, has the following forcible remarks:

"We believe most fully from personal experience, as well as observation, that an abundant use of fruits has a strikingly delightful and elevating influence upon the animal spirits, as well as upon the mind and soul; that the constant habit of employing fruits will cure many diseases, and have a most beneficial effect upon the individual and the race, and prove, next to air and water, the greatest of all preventive medicaments."

And he further continues:

"We do not labor merely that this princely merchant and that lordly nabob should have his table loaded with choice "specimens," but that every man, woman, and child, month in and month out, should revel in these delicious and healthful luxuries, till they become the cheapest of common necessities."

The Boston *Medical and Surgical Journal* uses the following language:

"Instead of standing in any fear of a generous consumption of ripe fruits, we regard them as positively conducive to health. The very maladies commonly assumed to have their origin in the free use of apples, peaches, cherries, melons, and wild berries, have been quite as prevalent, if not equally destructive, in seasons of scarcity.

There are so many erroneous notions entertained of the bad effects of fruit, that it is quite time a counteracting impression should be promulgated, having its foundation in common sense, and based on the common observation of the intelligent. We have no patience in reading the endless rules to be observed in this peculiar department of physical comfort. No one, we imagine, ever lived longer or freer from the paroxysms of disease, by discarding the delicious fruits of the land in which he finds a home. On the contrary, they are necessary to the preservation of health, and are therefore caused to make their appearance at the very time when the condition of the body, operated upon by deteriorating causes not always understood, requires their grateful, renovating influences."

The *Rural Annual* for 1856 says:

"As good fruit becomes more common, and accessible to a greater number, those fevers and bilious disorders so general in new countries where fruit is scarce, will become lessened, and health and happiness increased."

Dr. TRALL, in his "Hydropathic Cook-Book," uses the following forcible language. Speaking of apples, he says:

"I can imagine no branch of agriculture, 'domestic economy,' or even 'political science,' more useful to mankind than that of raising good apples. This kind of farming would tend wonderfully to elevate the human race above its swine-eating propensities. At present a large portion of the apple crop of the world is perverted to hog-feeding and cider-making—neither animal nor liquor, when fed or made, being fit for food or drink.

"A little attention to pruning, budding, grafting, and transplanting would enable our American farmers and fruiterers to supply our markets, profitably to themselves, with an abundance of sweet, mellow, luscious apples, so rich and savory, indeed, that but little else than a piece of good bread would enable the veriest epicure to make a luxurious meal."

On the subject of the effect of fruit on health, the editor of TUCKER'S *Annual Register* has the following truthful remarks:

"FRUIT *versus* DISEASE.—In a recent conversation with an intelligent person who has made long-continued and extensive observations on climate and disease, we were assured that nothing had a more beneficial influence in preventing intermittents and the other effects of malaria than a moderate and regular use of wholesome,

well-ripened fruit. Our own limited observations abundantly confirm this opinion. This being the case, what millions in losses, to say nothing of the untold discomforts and sufferings experienced by the settlers of the Great West, might thus be prevented or mitigated! Our Western emigrants could carry no better medicine-chest with them than a box well packed with a well-selected assortment of early-bearing fruit-trees. Dwarf pears, for instance, often bear even the first year, and sometimes produce abundantly in the course of the first two or three seasons; we have known a peach-tree to yield three pecks the third summer. The smaller kinds, such as strawberries, raspberries, gooseberries, and currants, afford a quick return of very wholesome fruit. A little attention and care of this kind, in connection with a moderate share of information and intelligence, would doubtless prevent many serious losses, and avert a vast amount of positive suffering during the first few years of frontier life, when a sufficient degree of privation and inconvenience is often experienced, even with the blessing of uninterrupted health."

The apple, for instance, contains a large amount of nutrient material. It is used much more plentifully in Germany, France, and other European countries than with us. The common laborers frequently make a meal of apples, with perhaps an addition of bread alone. It is stated that the operatives in Cornwall, England, regard them as nearly as nourishing as bread, and more so than potatoes; and they have been known to assert that they could stand their work better on baked apples than with any other kind of diet, without meat. In our own country, those who make a free use of apples and other fruits for food are seldom troubled with dyspepsia, or any form of indigestion.

II. Fruit is a Cheap Article of Food.

Apples, peaches, pears, plums, cherries, and even strawberries, and many other small fruits, can be produced as cheaply as wheat or pork, corn or potatoes. A well-set orchard of healthy trees, eight to ten years old, will produce, at a moderate estimate, from one hundred to three hundred bushels per acre. These, at twenty-five cents per bushel, at which price they can be afforded as food even for stock, will yield a very fair income—much more than can be ordinarily obtained on large farms at other branches of farming. Thomas, in his *Fruit Culturist*, says: "Good winter apples always

command a market. * * * The farmer, then, who sets out twenty acres of good apple orchard, and takes care of it, may expect, at no remote period, a yearly return of five to fifteen hundred dollars a year."

Downing, referring to strawberries, says "they are so easily grown that the poorest owner of a few feet of ground may have them in abundance;" and Barry says "any one who can manage a crop of corn or potatoes, can, if he will, grow strawberries."

Other varieties, both of orchard and garden fruits, it is well known, are about as easily and cheaply grown as apples and strawberries.

III. The Culture of Good Fruits is Profitable.

It may well be doubted whether any branch of agricultural production pays better than the growing of good fruit for the market —especially where a market is attainable; and, since railroads are beginning to traverse all portions of our widely-extended country, few localities are found to be beyond the reach of a market. Twenty-five or thirty years ago, as at the present day, men were everywhere found prophesying that in a few years more the markets would be glutted, and the orchards then planting would be useless. Yet the prices of the best kinds of fruit have ever since been steadily advancing; and we hazard nothing in saying that they will advance, or that, at least, the present fair prices will be maintained for twenty-five, or even fifty years to come. It should be borne in mind that there will be a continued very large increase in the population of our towns and cities, who are necessarily non-producers of fruit; and further, that the amount of consumption will probably before many years quadruple that of the ratio of increase of population. In numberless instances the profits have been enormous; and while these are to be regarded as only occasional cases, and exceptions to the general rule, yet, in all instances where the business has been properly conducted, and markets not too remote, the profits have been exceedingly large. No surer source of income, it may be safely urged, and at highly remunerating prices, can be found, than that of a fruit orchard, consisting of a proper assortment of the best varieties of fruit.

Even in localities beyond the reach of market, structures for drying can be reared at comparatively small expense, which will

render the business of drying for market a fair one. Eastward, and that, too, where a market for fresh fruits is readily attainable, these drying establishments are becoming common. The demand for dried fruits will become greater every year.

Large sums of money are expended abroad annually for fruits which might easily be produced at home in much better perfection and at far cheaper cost—such as grapes, figs, currants, etc. Even fresh pears have been imported from France by the New York confectioners.

In addition to our home market, a large foreign market will doubtless spring up. American apples and pears have already been sold in Europe and the East Indies, in a fresh state; and peaches and strawberries have been sent to the West Indies.

It is fair, then, to assume that, as the facilities for quick transportation increase, and as the various processes for preserving fruits in a fresh state become perfected, not only all sections of our widely-extended country, but the markets of the whole world, will be opened to our fruit-growers!

But suppose both home and foreign markets fail us, it furnishes no valid reason why every farmer should not plant and cultivate enough to supply his own wants luxuriously, and every mechanic and other head of family have his well-stocked fruit-garden. Of the millions of these farmers throughout the country, there are not half even in the old States, and not one tenth of them in the new, who produce enough for their own consumption! This home supply should at least be furnished, let the markets be as they may.

IV. Fruit Furnishes an Amount of Good Living not Otherwise Attainable.

Those who have not been able to realize this fact from actual experience, will be astonished to know what a vast amount of good, and even luxuriant food, the orchard and fruit-garden can be made to yield with the proper care and management. It will not be too much to say, that a good selection of fruits in the market, worth any given sum, can be made the source of more real comfort and substantial enjoyment than twice the market value of any other kinds of food. This is owing mainly to the various modes of cookery, and the great variety of ways in which they can be served up.

V. There is Economy in the Use of Fruit.

On this point we can not do better than to copy entire the following paragraphs, which we find in a horticultural journal without credit:

"Every man of family, who keeps a good supply of stewing and baking apples, of his own raising, saves a great many hard-earned dollars yearly, otherwise to be paid to the miller or butcher. Or, if he raises his own grain and meat, an equal amount is thus reserved for market. Then what a valuable addition to the comfort, variety, and luxury of the table! By the first of summer the thick tresses of strawberries begin to redden in the sun; and half a dozen quarts of this melting crimson fruit may be had each day for the table, from as many half-rod beds. Cherries, currants, and raspberries continue through the first half of summer, followed by early juicy apples, rich bloom-dusted plums, golden-hued apricots, and buttery and melting pears.

"Now, we do not say, as some mistakingly remark, that this fine and delicious supply costs nothing after the trees are planted; for good fruit can not be expected unless the ground is well cultivated and manured. But it does not cost half as much to cultivate an acre of fruit as an acre of potatoes or corn; while the amount obtained is greater than either, and all ready for the table without going through the process which the grain crop requires, of threshing and winnowing, and grinding, and kneading and baking.

"By planting rich, highly-flavored apples for stewing and for pies, instead of poor ones, each family may save from fifty to two hundred pounds of sugar annually, in sweetening and in spices. A friend of ours finds it cheaper to buy good fall pippins for fifty cents a bushel, than poor sorts, sold as 'cooking apples,' for fifteen cents a bushel. He uses the Talman Sweeting largely for baking and for puddings, and thinks that an Indian apple-pudding, made by this natural sweetening, the cheapest and the best pudding in the world. He saves from $75 to $100 annually in the cost of his table by this fruit."

In reference to the economic influences growing out of the Fruit Culture, Mr. Thomas, in his excellent work, has the following highly instructive paragraph:

"It is not, however, merely as a source of income, that the cultivation of the finer kinds becomes profitable. The family which

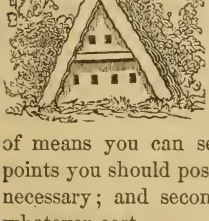
is at all times supplied with delicious and refreshing fruit from its own gardens, has within its reach not only a very important means of economy, but of real domestic comfort. An influence is thus introduced of an exalted character; a tendency is directly exerted toward the improvement of the manners of the people. Every addition to the attractions of home has a salutary bearing on a rising family of children. The difference between a dwelling with well-planted grounds, and well furnished with every rural enjoyment, and another where scarcely a single fruit-tree softens the face of bleakness and desolation, may, in some instances, and to many a young man just approaching active life, serve as the guiding influence between a useful life on the one hand, or a roving and unprofitable one on the other—between a life of virtue and refinement from early and favorable influences, or one of dissipation and ruin from the overbalancing effects of a repulsive home. Nor can any man, even in the noon or approaching evening of life, fail to enjoy a higher happiness, with at least an occasional intercourse with the blossoming and loaded trees which his own hand has planted and pruned, than in the noise of the crowd and tumult of the busy world."

When apples, grapes, currants, and raspberries become as common on the tables of our people as potatoes, taking the place of the execrable pork and bacon—with the poor as well as the rich, in the farm-house and that of the villager—then will fruit culture have attained a position in the world's economy that it deserves, and become a source of profit and good second to no other industry.

We conclude this introductory chapter, then, with the repetition of this urgent advice, to all who may see these pages—to plant trees! —PLANT TREES! without further delay, and cultivate them properly and carefully, and our word for it—and not our word alone, but the united testimony of thousands of those who have demonstrated the fact—they will be to you at no very distant day a source of pecuniary profit and rich enjoyment.

Chapter Two.

PRELIMINARIES TO PLANTING.



ASSUMING, dear reader, that you have already decided to plant an orchard, the next thing to do is to fix upon its extent. In the consideration of this question of extent, two other important matters are to be taken into account—these are, the quantity of ground you may have suitable and to spare, and the amount of means you can set apart for the purpose. In settling these points you should possess, first, a knowledge of the kind of ground necessary; and second, a determination to do the work well, at whatever cost.

For an ordinary family of five to ten persons, not less than three acres will suffice for home consumption alone—and as many more as can be made profitable for market use. On these three acres can be stocked from two to three hundred standard trees of the different sorts of fruit, besides a due proportion of all the smaller kinds—an amount which, if properly managed, will in a few years afford an ample supply for family use.

COST.

The cost of first planting will vary widely in different localities—depending on the condition of the ground, the quality of the soil, prices of trees, price of labor, etc. An approximate calculation may be made, however, by estimating the cost of preparing the ground and planting the trees, at an amount equal to the cost of the trees in the nursery; and when ditching and underdraining is necessary, at double that amount. The following rule should be inflexibly observed in all cases: *Never slight the work, nor plant an inferior tree, because it is cheaper to do so!* Work half done is very poor economy in planting an orchard, as well as in most other things; and a tree costing only half price in the nursery, may turn

out to be a very dear one in the end. The very best varieties (and these are not always the most costly), as well as the very best trees, are those from which you must expect to realize the most profit.

ESTIMATE FOR THREE ACRES.

The following estimate will answer for an orchard of three acres of ground, with such variations as circumstances may require. [The number of trees will vary somewhat as the shape of the ground is varied; the calculation is based on a plat twenty-four rods long by twenty wide.]

Eighty apple-trees, thirty-three feet apart, covering two acres.

Seventy peach-trees, sixteen and a half feet apart, set around three sides of the whole.

There will then be left in front one acre, which may be divided into two equal plats of 132 by 166 feet. These may be filled as follows:

In No. 1.—Twenty standard pears, thirty-three feet apart, in continuation of the apple rows.

Thirty-two dwarf pears, in the same rows, seven feet apart, and thirteen feet from the standards. And—

Twenty-seven pyramid and dwarf plums, quinces, cherries, etc., in the alternate rows, sixteen and a half feet apart.

In No. 2.—Such number of almonds, apricots, grapes, nectarines, gooseberries, currants, raspberries, blackberries, and strawberries, as fancy may dictate, and will stock it properly.

The above estimate will constitute an orchard of about 250 orchard trees—standard and dwarf—and perhaps as many more of the garden or bush fruits.

DISTANCES.

Every planter has his own opinion regarding the distance which trees should be planted from each other. Besides, some kinds of soils and localities require greater distance than others; and some varieties will bear to stand closer than other varieties of the same fruit. A good rule is that, when full grown, the tops should not be nearer to each other than one third their diameter. An apple-tree, for example, when fully grown, will spread, on an average, to a distance of twenty-five feet; the rule will give thirty-three feet as the proper distance apart. Peaches seldom spread, or should not, if properly pruned, more than twelve to fifteen feet; the rule gives

sixteen to twenty feet as the distance to plant. In planting an orchard of apples, with plenty of ground, thirty-three feet is probably the safest distance; yet, if ground is an object, they will do at twenty-five feet. Apples may be planted a little wider—say forty feet—and rows of peach-trees planted both ways between; as the peach, not being so long lived, will die out before the apple has attained to a large growth.

When the saving of ground is an important consideration, and none but standard trees are to be planted, more space may be obtained by planting in rows, according to the following diagram:

Smaller trees may be set closely in rows, as represented in the figure below:

This last method is recommended for village plats, where it is desirable to combine the raising of vegetables with that of fruit; as the spaces between the rows may be appropriated to any kind of root crop, with decided advantage to the trees.

The following table of distances for the various kinds of fruit, condensed from THOMAS' *Fruit Culturist*, seems to have been acquiesced in by most fruit-growers:

APPLES.—For large trees	25 to 40 feet.
For pyramids and dwarfs	6 to 8 "
PEARS.—Large trees on pear stocks	20 "
Pyramids on " "	8 to 10 "
Pyramids on quince "	6 "
Dwarf standards on quince	8 "
PEACHES.—Full growth	20 "
Shortened in	12 to 15 "
CHERRIES.—Common standards	20 "
Pyramids on common stocks	10 "
(Dukes and Morellos require less).	
PLUMS.—Standards	15 "
Pyramids	6 to 8 "

Apricots	15 to 20 feet.
Quinces	6 to 8 "
Grapes.—On 8-feet trellis	25 "
On 12 " "	16 "
Trimmed to stakes	4 to 6 "
Gooseberries and Currants	4 to 5 "
Raspberries and Blackberries	4 "

For the above distances, the following is the number of trees required for an acre:

40 feet apart	27 trees.	12 feet apart	302 trees.
33 " "	40 "	10 " "	435 "
25 " "	69 "	8 " "	680 "
20 " "	108 "	6 " "	1,208 "
15 " "	193 "	4 " "	2,720 "

LOCATION.

Much has been said and written concerning the location of orchards. Situation and aspect doubtless have their effects; yet no one should neglect to plant merely because he can not give his trees such an aspect as he may desire. Trees in favorable situations will undoubtedly produce more good crops than those less fortunately situated; yet many seasons occur when the causes of the difference do not arise, and trees in any exposure will produce abundantly. To this general rule there can be very few exceptions, namely—*Elevated situations are better than lowlands, and the brows and sides of hills are to be chosen in preference to the valleys.* Numerous proofs have been adduced to show that the peach might be successfully grown much farther north than it usually is, if the most elevated positions were chosen instead of the warm valleys. So, farther south, frequent severe frosts cut off the crops on the low grounds, while those on the more elevated and exposed situations are not affected.

The old rule was to choose a southern or southeastern exposure. Coxe, whose work was issued about 1820, and who planted a large number of trees from 1794 to 1810, in different exposures and aspects, says: "A southeast aspect, which admits the influence of the early morning sun, and is protected from the pernicious effects of northerly winds, will be found to be the best site for an orchard." This is at variance with most later authorities, and with the expe-

rience of practical fruit-growers at the present day. A northern exposure is now very generally preferred. This is because the action of the warm sun, in a southern exposure, will too soon thaw away the frost about the roots, and occasion the buds to swell—leaving them exposed to alternations of frost and thaw. In the West, the rolling prairies near the woodland, the hazel ruffs that skirt the prairie and wood, and the richest portions of the timbered bluffs or highlands that overlook the rivers, are regarded as the best locations. The best bearing orchards within the knowledge of the writer are those on the bluff overlooking the Mississippi at the Lower Rapids.

SOIL.

Fruit trees, like corn and cabbages, will grow on almost any kind of soil; yet some soils are more suited to their natures than others. They require a soil strong enough to give the tree a vigorous growth, and the better and more vigorous the growth of the tree, the better will be the character of the fruit. As a general thing, any soil that will produce a good crop of corn will be good for fruit-trees. A strictly alluvial soil, however, is not to be recommended; as, while it will produce a rank growth of wood, it will not make so hardy or fruitful a tree; nor will the quality of the fruit be equal to that grown on a less fertile soil. A calcareous soil is the best adapted to most kinds of fruit; yet in other than limestone regions a gravelly or sandy loam will be found to answer a good purpose. Stiff, clayey soils are not promotive of a good growth; yet they can be rendered available by a proper incorporation of sand, manure, and vegetable mold. Most soils—even those in the limestone region—require an addition of more or less lime and potash, as these ingredients enter largely into the composition of most fruits.

PREPARATION OF THE GROUND.

Not one in a hundred of those who plant trees bestows the necessary care and attention to the preparation of the ground. A very common mode is to dig a hole about a foot wide and five or six inches deep, stick in the tree, bending the roots or cutting them off to bring them within the proper compass—shovel in a few spadefuls of dirt or sod, tread it down with the foot, and the job is done! If the tree grows, well; if not, the planter has only been *unlucky*, and all the neighbors conclude not to plant, *it is so hard*

to make trees grow! Is it any wonder that three out of every four trees taken from the nursery die without having reached the stage of fruit-bearing?

In the first place, the soil must be dry before planting. If not so naturally, it must be made so by deep plowing, and, if this will not suffice, then by underdraining. A clay subsoil should be underdrained to the depth of three feet; but any soil not very retentive of water may be sufficiently drained by the use of a subsoil plow and a strong team. With good underdraining and a proper admixture of manures, ashes, sand, and loam, the toughest clay soils may be reduced to a proper condition for fruit trees. All soils that are sufficiently porous to drain well should be first prepared with the plow, harrow, and sub-soiler; and then the holes for the trees should be made only of proper size and depth to admit the roots in their natural position, and at two or three inches greater depth than they stood in the nursery. Deep holes in a hard and tenacious sub-soil will injure the trees by retaining too much water. Such soils should be avoided for a fruit orchard; or if used, should first be properly underdrained. Many young trees die from the effects of standing in deep holes, prepared for them at great expense.

Previous to planting, the soil should be enriched with well-rotted barn-yard manure, thoroughly intermixed and pulverized by the harrow. If planting is to be done in the spring, the plowing should have been gone through with the fall previous, and then thoroughly stirred again just before planting. When the whole field is thoroughly prepared by the plow, it can be cultivated to some useful crop, and the trees will be more likely to receive the necessary tillage than they would if standing in the field alone.

MANURING.

It is a quite common experience that the quality of fruit in orchards will, after a few years, gradually decline, yielding only small and imperfect specimens. Some varieties will show this decline much sooner than others. Negligence in regard to manuring is generally the cause of this deterioration. The application of barn-yard manure will cure the evil, though with some fruits other ingredients are very valuable. Ashes is a good fertilizer for most fruits, and is worth more to the fruit-grower, as such, than for any other purpose. In the peach orchard there is little danger of

getting too much. A free use of lime on some soils is very beneficial, and in many cases salt may be used to advantage. This latter has been strongly recommended as a preventive to blight in the pear.

Chapter Three.

TRANSPLANTING.

LAYING OFF THE GROUND.

THE best way to lay off the ground, after it has been fully prepared and the distances decided upon, is to measure along the sides and ends, setting a stake at the proper distances, and then driving small stakes, say one foot high, at all the points where the lines thus indicated intersect each other. After the ground is staked, commence digging the holes—and this should be completed before the trees are removed from the nursery.

SEASON FOR TRANSPLANTING.

The proper season for transplanting a tree is any time between the falling of the leaf in autumn and the swelling of the buds in spring; and, in the case of a hardy tree, as the apple, it probably makes but little difference whether it be done before the winter or after it. With other trees it is different; the less hardy ones, with diminished strength, can not so easily withstand the severe frosts and piercing nor'westers of that season. Hence they should be transplanted only in the spring. Apples may be removed either in November or April, provided it be done well, with probably about equal success. COXE, who did a great deal of orchard planting in his time, always planted in the autumn, generally about the middle of November—sometimes, however, as early as October, and sometimes as late as December. THOMAS, in his *Fruit Culturist*, says: "Where the work is well done, both are successful." The editor of the *Illustrated Annual Register*, 1855, says that planting should be done at that season when it can be best done; and adds—"after all, the subsequent treatment of trees has more to do with their success, at least twenty fold, than the season of the year for setting."

TAKING FROM THE NURSERY.

Trees should be injured as little as possible in removing them from the nursery. Taking them from the row, and tying in such a manner as to be easily transported, is properly the nurseryman's business; yet it is always best to keep a watchful eye to the work. Especial care should be taken that the roots are not broken or bruised, or cut away by the spade in taking them from the ground; and when any of the roots do become injured, they should be nicely cut off with a sharp knife. As soon as dug, the trees should be carefully arranged in convenient bunches, as much damp earth as possible placed about their roots, and then closely enveloped in some coarse sacking, or other suitable thing, and firmly tied with strong cord. If they are to be re-set at but a short distance from the nursery, these precautions are unnecessary, though if they are to be carried any considerable distance, too much care can not be used in this respect. In all cases the roots should be carefully secured against exposure to the air and sun.

If from any cause the trees are not to be immediately planted, they should be placed in the ground, root and stock, by digging a trench and shoveling loose dirt upon them, to a depth sufficient to exclude the air. The weather will not always permit of immediate re-planting, but it should in no case be delayed longer than is absolutely necessary. This covering should be done in orchard or garden, and the trees should be removed from the trench one by one as they are planted.

SELECTION OF TREES.

There is great diversity of opinion in regard to the proper size of a tree for transplanting, though best informed and most experienced planters now prefer a two-year-old tree rather than one of a larger size. In thrifty, well-tilled nurseries, trees of that age will average about five feet high; and such a tree can be more easily handled, and is also in a better condition to sustain the violence done to its nature by transplanting, and better able to recover from it, than those of an older and larger growth. Care should also be taken to select trees of well-branched and well-formed heads, and of as near the same size, vigor, and general condition as possible.

SETTING OUT TREES.

It requires three men, or two men and a boy, to set out trees as it should be done. Before inserting the roots into the hole prepared to receive them, they should first be dipped into mud made of the rich surface mold, to cause the earth to adhere to all their parts. This done, place the tree in its proper position in the hole, shovel in a small quantity of the finely pulverized mold, and then give it a gentle shaking suddenly up and down, in order to settle the dirt closely about the roots. One person to hold the tree to its proper position, while another shovels in the earth. When a sufficient quantity of the earth has been placed upon the roots to bring it level with the surface of the ground, tread it down gently with the foot, and then add more, rounding it to a slight mound, with the stem of the tree for a center. The tree should be placed in the hole so as to allow it to stand about as deep, when the earth becomes settled around it, as it stood in the nursery.

It is recommended by some to plant the tree in the orchard in the same relative position to the points of the compass that it occupied in the nursery. This may or may not be beneficial; at any rate, it can do no harm, and it is quite an easy matter to mark the tree before it is lifted, so as to indicate its position.

If the planting be done in autumn, there should be a mound of earth ten inches to a foot high, and three feet in diameter, raised around the tree to steady it, and protect its roots from frost and the bark from mice. When the ground becomes well settled in the spring, the mound should be removed.

TRIMMING.

Before setting out, each tree should undergo a proper degree of trimming. This requires considerable judgment. As the branches and roots of a tree depend upon each other for support, it will readily be understood that neither should be overtasked. In removing it from the nursery, all the small fibrous roots, and sometimes many of the larger, are lost; hence the top must be trimmed to correspond. To do this properly, all the leading shoots should be shortened back one half or two thirds of the current year's growth; and, if the roots have been much injured, the leading branches should be headed back still more.

Chapter Four.

AFTER-CULTURE.

PLOWING AND HOEING.

NE of the most common errors among the people in regard to fruit-growing is that pertaining to after-culture. Many suppose that all that is necessary to get good fruit, is to set the tree in the ground, right end downward, to be sure, and nature will do the rest. This is a most fatal error—nothing can be more unreasonable. It is as absolutely necessary that the tree which you have planted should receive culture and care afterward, as that the corn which rustles in the breeze should be plowed and hoed and harrowed to make it yield its golden harvest. Trees, as well as vegetables, must have food and drink. It is by culture that they obtain them.

Hence, in the orchard, the growing of some crop is very desirable. Roots are perhaps the best of all. Potatoes, beets, beans, carrots, parsneps, onions—all require thorough culture, and do not shade the trees; while Indian corn, clover, grass, and all the cereal grains, should be rigidly excluded.

PRUNING.

In the matter of pruning we find there is a great diversity of opinion among experienced fruit-growers. Some advise a free use of the knife; others prune but little, or none at all. The first are doubtless right, as regards some sorts of trees; while in regard to other varieties, the second class are correct. And the point must be settled between them by considering the objects sought to be attained by pruning.

To our mind there are four objects to be had in view in pruning a fruit-tree. These are—

1. To relieve it of its dead and decaying branches.

2. To promote the growth of the tree.

3. To encourage the production and increase the size and quality of the fruit.

4. To change its shape.

Now, the above being ALL the objects for which a tree ought to be pruned (except as heretofore stated, under the head of "Trimming," to preserve an equilibrium between roots and branches in transplanting), it is evident that while a permanent vigor and productiveness are maintained without it, the less pruning the better. Many planters insist that a tree should never be pruned except for the first of these objects; because, as they allege, if a tree be faithfully kept free from all dead and decaying wood, its growth and productiveness will both be promoted. This is doubtless true to some extent with some sorts of fruit, and unless some peculiar form is desired, it is better to do but little other pruning. Yet with all it is sometimes necessary to prune more freely. Some varieties of the apple, for instance, will grow, if left alone, to too thick ahead, and require thinning out; others grow so straggling that it is frequently necessary to cut away drooping, or crooked and deformed branches, to give the tree some symmetry of appearance. After the first object is attained, the apple, the pear, and the cherry, as standards, require little more, except in the cases last alluded to. Other trees require much more, which will be treated of in the proper place.

PROTECTION.

All orchards and fruit gardens, whether of old or young trees, should be carefully protected against the depredations of cattle or other animals. Good fences to secure them are indispensable, as it is utter folly to expend time and money in planting and rearing a fine orchard, and then allow animals to disfigure, maim, and destroy the trees. Cattle, horses, or sheep should never be allowed to run in orchards; nor should swine be admitted except at intervals of very short periods, in order that they may have time only to eat up the fallen fruit, and not to bark the trees or root up the ground.

In some sections birds are great depredators upon fruit, but as a general thing they do more good in devouring the insects than harm in consuming the fruit. If they become too numerous, they can be frightened away with guns.

MULCHING.

This is simply the process of distributing some proper material around the root of each tree to retain the moisture. When not thus protected, the ground will frequently bake and greatly retard the growth of the tree. Any coarse litter, straw, or forest leaves will be suitable for mulching. It should be used plentifully—spread on to a depth of at least six inches. When properly mulched, trees will retain moisture about their roots, and make a vigorous growth, through the dry and sultry summer months, while others not protected in this way cease to grow altogether, and in many cases wither and die.

PART II.

THE DIFFERENT KINDS OF FRUITS.

Chapter One.

THE ALMOND.

THERE are but few of the almonds worthy of cultivation in the United States. The Hard-Shells may be raised in the Middle States, and the Soft-Shells in the South, while neither can be successfully cultivated north of about forty-two degrees, except under shelter.

A warm, sandy soil is most suitable for this fruit; yet any soil in which the peach and plum will thrive will answer for the almond.

The almond is propagated from the seed, or by budding on the peach or plum. The after-culture may be the same as for the peach —which see.

VARIETIES.

1. SWEET HARD-SHELL.—This is a hardy and productive variety, succeeding well in the climate of Western New York, and still farther north. Nut very large, with a hard shell, and a large, sweet kernel; ripe here about the first of October.—*Barry.*

Tree vigorous, brilliant, and showy.

NOTE.—In presenting the different varieties of fruit introduced into this department, we have chosen to adopt the descriptions—modified and condensed into as narrow limits as possible—of some of the best and most experienced pomologists of the country, whose writings are before the public. In the choice of selections, however, we have been guided by our own judgment, influenced, of course, by an extensive reading and thorough examination of the opinions of others.

2. Sweet Soft-Shell.—This is the almond of the shops, of which such immense quantities are annually imported from abroad. South of Virginia, we believe, it succeeds well; and so beautiful a tree and so estimable a fruit deserves the attention of all fruit-growers.—*Barry.*

Cultivators who are desirous of obtaining as great a variety of fruit as possible, would do well to plant a few trees of one or the other of the above-named sorts. Amateurs may find a few other kinds, but they are generally inferior or useless.

Chapter Two.

THE APRICOT.

The apricot is not very generally grown in the United States. This is partly owing to the fact that people are not much acquainted with its uses, and partly to its being so frequently destroyed by the curculio.

This fruit is also propagated on the peach and plum, as well as on stocks from its own seed. The plum is regarded as the best.

The soil best adapted to the apricot is a strong loam. On lighter soils free mulching and frequent watering are highly beneficial.

VARIETIES.

The kinds most recommended for general cultivation are—

1. Large Early.—Full medium, oblong, pale orange, spotted orange cheek; rich, juicy.—*Thomas, in Annual Register.* Ripens middle of July.

2. Early Golden.—(Dubois' Early Golden.) Small, smooth, pale orange, sweet, good; free from the stone. Early—midsummer. Hardy and productive.—*Annual Register.*

3. Breda.—Small, brownish orange, juicy, rich. Season, first of August. Tree hardy, good grower, productive.—*Elliott.*

4. Moorpark or Peach.—Large, round, orange, red cheek, juicy, rich, excellent. Ripens soon after the Breda, but less hardy. —*Annual Register.*

5. Large Red.—Dark orange red; round, large, sweet, and juicy.—*Downing.*

6. Shipley's Large.—A good grower and productive.—*Elliott.* Adapted to certain localities.

There are other varieties with good local reputation, and new ones are from time to time introduced; but the above will probably be found as valuable as any.

In view of the vast increase of the curculio over the United States, the cultivation of the apricot cannot be recommended, except in those portions of the country free from the destroyer (if there are any such). Few persons who plant on a small scale will give that care and attention required to save the fruit in those localities infested.

Yet the apricot, being so delicious a fruit—and the tree being about as hardy as the peach or plum, easily grown, and generally a free bearer—those who would plant largely for commercial purposes, and make it their business to protect their crops with the same energy that the tobacco and cotton growers protect their crops against insect enemies, may be expected to reap their reward; but it must be a war of extermination.

Chapter Three.

THE APPLE.

The apple is undoubtedly the most valuable, as well as the most widely known, of the whole family of fruits. Downing terms it the "world-renowned fruit of the temperate climates;" and it seems to be a native of at least three quarters of the globe. It was well known to the ancients, several varieties of it having been described by writers of antiquity.

Yet widely known as it is, it has nowhere become appreciated as it should be. A large portion of the people of this country seem not to have yet learned that an apple can be used in any other way than eaten raw, or that it can be introduced into the general cooking of the family. Thousands will purchase and eat an apple merely to gratify a taste for its aromatic flavor, without ever once thinking of it as an article of food; and among that rapidly increasing class which is beginning to discover that the apple may be made a staple necessary of life, very few yet know in what a diversity of ways it may be made to contribute to their wants.

The apple will flourish in a greater variety of soils than most other fruits. A dry, warm soil, with a good mixture of rich loam, is the best, with a plentiful supply of lime and potash. It thrives well, in many instances, on gravelly and even stony land, with a good mixture of rich surface mold, and subsoil not too compact.

VARIETIES.

Elliott states that there are now probably two thousand varieties of the apple, described in whole or in part, by the various horticultural writers. It may well be doubted, however, whether there are one tenth of that number so distinct that any but the most experienced pomologists can recognize their characteristic differences. It is no doubt true that, in many instances, apples of

the same variety have different names given them, and are differently described, when grown in dissimilar soils and conditions. And so great is this distinction that frequently experienced fruit-growers have been deceived. Generally speaking, there is a marked difference between Eastern and Western apples of the same variety.

Of the very large number of sorts described by writers on fruits, something over a hundred only of the most valuable have been selected for description in this work. For convenience, they are classed as SUMMER, FALL, and WINTER Apples.

CLASS I.—SUMMER APPLES.

THIRTY VARIETIES.

1. AMERICAN SUMMER PEARMAIN.—Medium size, oblong, skin smooth, red, and yellow; tender, juicy, and rich. Tree, a slow but erect and handsome grower; bears early and abundantly; one of the best in nearly all parts of the country. September.—*Barry.*

It requires a deep, warm soil, well supplied with lime and potash, when it succeeds admirably in all sections.—*Elliott.*

2. BENONI.—Medium, roundish, or slightly conical; striped with bright red; tender, juicy, sub-acid, fine flavor. Handsome grower and good bearer, very valuable. Has proved fine in New England, New York, and some other places.—*Thomas, in Annual Register.* Ripens in August.

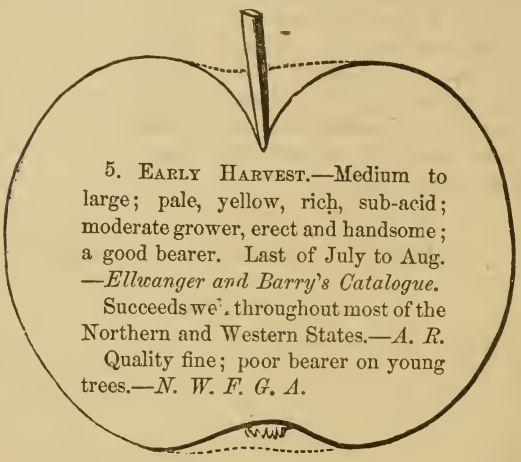
3. BOUGH APPLE.—(Sweet Bough or Large Yellow Bough).—Large, roundish; pale greenish yellow, very tender, excellent sweet flavor. Latter part of summer. Moderate and regular bearer. Succeeds well in Northern, Middle, and Western States.—*Annual Register.*

Not reliable for productiveness.—*N. W. Fruit-Grower's Association.*

4. CAROLINA RED JUNE.—Medium size, oblong, beautiful red, agreeable flavor. Fine grower, and bears abundantly.—*Annual Register.*

Pronounced the best early apple; hardy, beautiful, and productive when young.—*N. W. F. G. Association.*

Is a valuable early apple in Illinois and other parts of the West.



5. Early Harvest.—Medium to large; pale, yellow, rich, sub-acid; moderate grower, erect and handsome; a good bearer. Last of July to Aug. —*Ellwanger and Barry's Catalogue.*

Succeeds well throughout most of the Northern and Western States.—*A. R.*

Quality fine; poor bearer on young trees.—*N. W. F. G. A.*

Fig. 1.—Early Harvest.

6. Early Chandler.—Medium, roundish, striped, good quality. Extensively cultivated in Ohio, where it succeeds well. Vigorous and erect. August and September.—*Barry.*

7. Early Joe.—A beautiful and delicious small-sized, deep-red apple. Tree rather a slow but upright grower, and a most profuse bearer. Last of August.—*Ellwanger and Barry.*

Unsurpassed in quality by any early apple. Not extensively proved yet. Must be eaten fresh.—*Annual Register.*

8. Early Strawberry.—Medium, mostly deep red; tender, almost melting, mild, fine flavor. Tree a moderate, erect grower, and a good bearer. A beautiful and excellent variety for both orchard and garden. Middle to end of August.—*E. and B.*

9. Early Pennock.—Popular in Ohio—little known elsewhere. Magnificent, large, conical, yellow, and red, ripening middle of August.—*Barry.*

"Good," or second rate; bears profusely when young; valuable for market. Synonymous with Shaker's Yellow.—*N. W. F. G. A.*

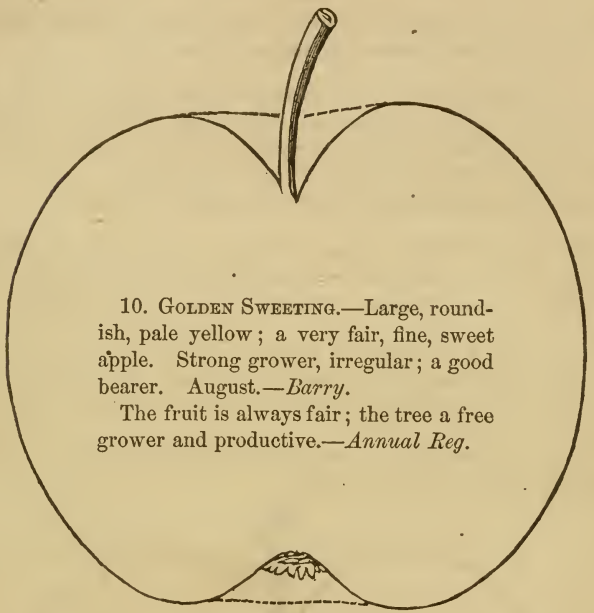

10. Golden Sweeting.—Large, roundish, pale yellow; a very fair, fine, sweet apple. Strong grower, irregular; a good bearer. August.—*Barry.*
The fruit is always fair; the tree a free grower and productive.—*Annual Reg.*

Fig. 2—Golden Sweeting.

11. Garretson's Early.—Medium, greenish yellow, tender, juicy, and pleasant. Tree vigorous, very productive, and bears young. Not much disseminated. July and August.—*Barry.*

12. Holland Pippin.—A large, greenish yellow, sub-acid, rich, and excellent kitchen fruit. In use the whole month of August. Tree vigorous, spreading, and productive. Very distinct from the Fall Pippin, often called Holland Pippin in Western New York.—*E. and B.*

13. Keswick Codlin.—Large, oblong, pale yellow, acid. Tree erect and very vigorous; bears when quite young, and abundantly; excellent for cooking, from July to October.—*E. and B.*

Good for limited culture for culinary purposes.—*N. W. F. G. A.*

14 Lyman's Large Summer.—Large, round, pale yellow, rich and excellent. The trees require shortening, like the peach, to

keep up a proper supply of young shoots, as they bear in clusters on the ends of the branches. August.—*E. and B.*

15. Manomet Sweet.—An excellent late summer sweet apple. Tree vigorous and a good bearer. August and September.—*Barry.*

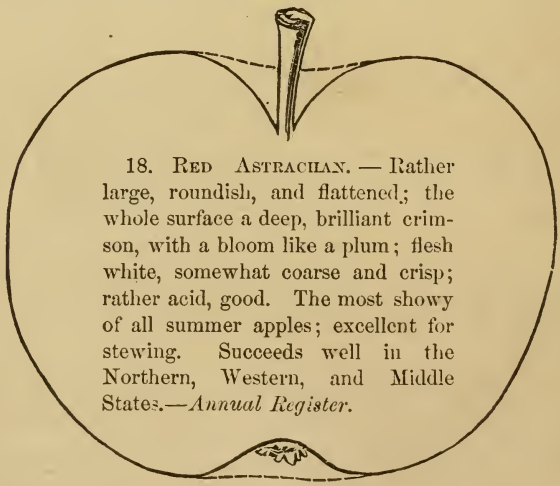
One of the finest early sweet apples, having a deep yellow skin, and a bright vermilion cheek.—*Hovey's Magazine.*

Flesh yellowish, juicy, tender, sugary sweet.—*Elliott.*

16.—Oslin Pippin.—A famous Scotch apple—succeeds well in Upper Canada. Medium size, roundish, yellow; flesh juicy, rich, and fine. Tree productive. August and September.—*Barry.*

17. Primate.—(Rough and Ready.)—Medium, pale yellow, with a blush on the sunny side; resembles summer rose; tender, mild, and good. Tree vigorous and a good bearer. August and September.—*E. and B.*

Ripens for several weeks through the latter part of summer. Not yet fully proved.—*Annual Register.*



18. Red Astrachan. — Rather large, roundish, and flattened; the whole surface a deep, brilliant crimson, with a bloom like a plum; flesh white, somewhat coarse and crisp; rather acid, good. The most showy of all summer apples; excellent for stewing. Succeeds well in the Northern, Western, and Middle States.—*Annual Register.*

Fig. 8.—Red Astrachan.

David Thomas says of the Astrachan: "Every householder who

owns land—if only a small lot—ought to have one tree of the Astrachan apple, both on account of its earliness and its excellence for cooking. It is so tender as to be cooked almost as soon as it is scalded, and so pure that it has no unpleasant tang, like the Yellow Harvest. It is acid, indeed, but sugar readily overpowers this defect.

"It is a tree of vigorous growth, an abundant bearer, and, what is worthy of note, it bears every year without fail.

"The fruit is of great beauty, having a *bloom* like a plum, on a fine red skin. I know of no apple at this season that would command more customers in market."

19. Prince's Harvest.—Fine for stewing when green; flesh white, tender, sprightly, and juicy; form flat, size middling. Tree not very vigorous, spreading, irregular. A great bearer, and in season during the whole month of July.—*Coxe.*

20. Sine Qua Non.—Medium, greenish yellow; tender, fine-flavored. Tree a slender and slow grower, but bears well. August. —*E. and B.*

Tree a poor grower in the nursery, hence not widely cultivated, although productive.—*Annual Register.*

Slow, poor grower, and an indifferent bearer.—*Elliott.*

21.—Sops of Wine.—Foreign. Tree vigorous, early bearer; esteemed for its peculiar pink flesh, as a curiosity for dessert. Medium or small, roundish; light, purplish red; flesh yellow, stained with pink, juicy, mild, sub-acid; "very good." August to September.—*Elliott.*

22.—Summer Rose.—(Woolman's Early.)—Medium, roundish, pale yellow, with a red cheek; tender and delicious: has a beautiful waxen appearance. Tree rather a slow grower, but good bearer. Middle to end of August.—*E. and B.*

This variety is not valuable for market purposes, but its juicy sprightly, sub-acid character makes it very desirable for the dessert. Requires rich, strong soil, lime, and phosphates to perfect the fruit, or keep the tree healthy.—*Elliott.*

23.—Summer Queen.—Large, conical, striped and clouded with red; rich and fine-flavored. Tree irregular; large, spreading head. August.—*Barry.*

Good on warm, sandy soils; poor on clay soils.—*Thomas.*

24. Summer Scarlet Pearmain.—(Bell's Scarlet.)—Medium to large, conical, mostly covered with crimson; flesh stained with red, tender and good. Trees grow freely, and bear young and abundantly. August and September.—*Barry.*

25. Sweet June.—Very good, productive, transient; best when fresh from the tree.—*N. W. F. G. A.*

26.—Summer Sweet Paradise.—A large, fine, sweet apple from Pennsylvania; round, green to yellow, juicy, sweet, and rich. August and September.—*Barry.*

27. Townsend.—Tree moderate spreading growth, abundant early bearer. Fruit medium, roundish, pale yellow, streaked with red; flesh dry, sub-acid; "very good." September.—*Elliott.*

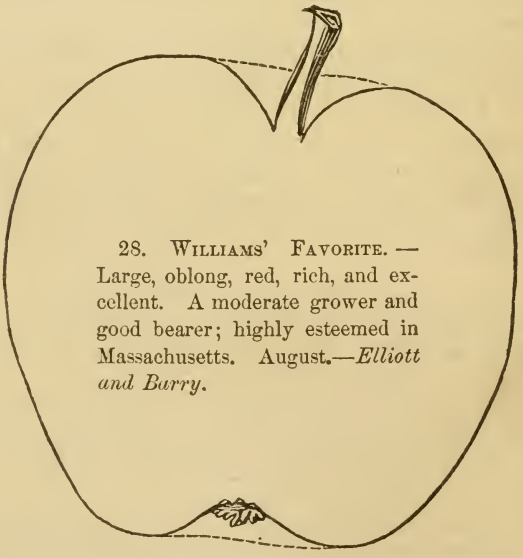

28. Williams' Favorite. — Large, oblong, red, rich, and excellent. A moderate grower and good bearer; highly esteemed in Massachusetts. August.—*Elliott and Barry.*

Fig. 4.—Williams' Favorite.

29. Trumbull Sweeting.—From Trumbull County, Ohio. Fruit above medium, roundish, flattened; pale yellow, blush, and red spots; flesh white, tender, juicy, sweet; "very good." September to November.—*Elliott.*

30. Wetherill's White Sweeting.—From New Jersey; tree vigorous; productive on light soils. Fruit large, roundish, oblong; pale yellow; flesh white, sweet; valued for baking and for stock. September.—*Elliott.*

CLASS II.—FALL APPLES.

FORTY VARIETIES.

31. Alexander.—A very large and beautiful deep-red or crimson apple, of medium quality. Tree vigorous and moderately productive.—October and November.—*Ellwanger and Barry's Catalogue.* Elliott pronounces it a poor bearer.

32. Autumnal Swaar.—Large, flattish, rich yellow; sweet, spicy, agreeable. An excellent fruit; not widely known. There is a greatly inferior sort known in Western New York as "Sweet Swaar."—*Annual Register.*

Barry, Thomas, and Elliott all make this variety synonymous with the "Sweet Swaar."

33. Autumn Strawberry.—Medium, streaked light and dark red; tender, crisp, juicy, and fine. Tree vigorous, productive; one of the best of its season. September and October.—*Barry.*

34. Beauty of Kent.—A magnificent English apple, rivaling the Alexander in size and beauty; striped with dark red; tender, but coarse, and indifferent in flavor; excellent for cooking. Tree very vigorous and productive.—*Barry.*

35. Bailey Spice.—Growth moderate; fruit medium; round ovate, tapering to the eye; light yellow, blush in the sun; flesh yellowish, sprightly, spicy. October. "Very good."—*Elliott.*

36. Cooper.—Very large, yellow, striped with deep red; tender,

juicy, and fine. Very highly esteemed in Southern Ohio. Productive and valuable. October.—*E. and B.*

37. Clyde Beauty.—Productive. Fruit large, roundish, conical, and slightly ribbed; pale greenish yellow, striped and mottled with light red, deep crimson in the sun; flesh white, fine-grained, juicy, sub-acid; "best." October to December.—*Elliott.*

38. Dutchess of Oldenberg.—A large, beautiful Russian apple; roundish, streaked red and yellow; tender, juicy, and pleasant. Tree a vigorous fine grower, and young and abundant bearer. September.—*E. and B.*

39. Doctor.—Much grown in Southern Ohio and Indiana, producing abundantly of second-rate fruit. Medium to large, flat, yellow; flesh tender, juicy. October to January.—*Elliott.*

40. Drap d'Or, or Cloth of Gold.—Very large, golden yellow; flavor mild and agreeable. Tree spreading, moderately vigorous and productive.—*E. and B.*

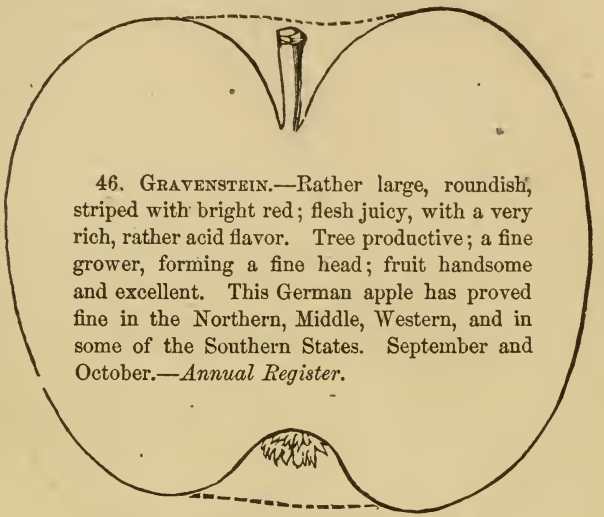
41. Fall Pippin.—Very large, roundish, oblong, yellow; tender, rich, and delicious; tree vigorous, spreading, and a fine bearer; esteemed generally.—October to December.—*E. and B.*

42. Fall Orange.—Large, roundish, oval; pale yellow; flesh sub-acid and excellent, if fresh and ripe from the tree. A strong grower; fruit always fair; tree bears when young; not widely known.—*Tucker's Annual Register.*

43. Fall Harvey.—A large, handsome yellow apple, resembling the Fall Pippin, but not so good. Oct. and Nov.—*Barry.*

44. Fleiger.—Medium, oblong, pale yellow, red cheek, tender and pleasant; has a beautiful, smooth, waxy appearance. Tree a great bearer. German. September and October.—*E. and B.*

45. Fameuse.—Medium, deep crimson, flesh snowy white, tender and delicious. Tree vigorous, with dark wood; a beautiful and fine early fruit. Succeeds particularly well in the North. November to January.—*E. and B.*



46. Gravenstein.—Rather large, roundish, striped with bright red; flesh juicy, with a very rich, rather acid flavor. Tree productive; a fine grower, forming a fine head; fruit handsome and excellent. This German apple has proved fine in the Northern, Middle, Western, and in some of the Southern States. September and October.—*Annual Register.*

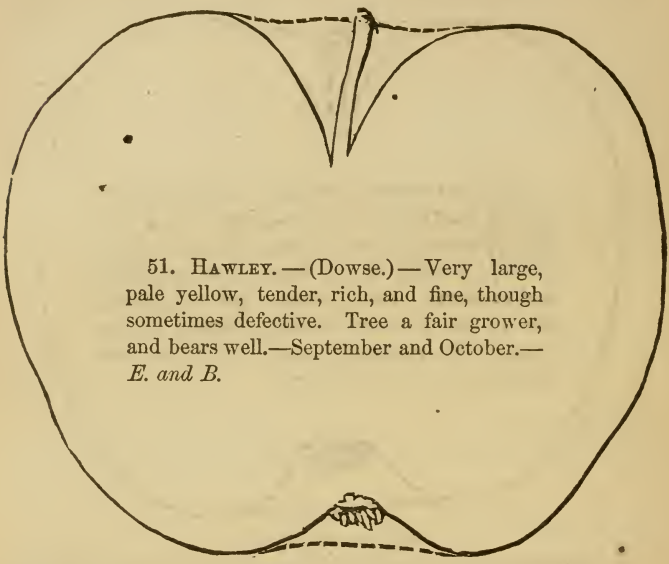
Fig. 5.—Gravenstein.

47. Golden Ball.—The trees do not bear well while young, but improve as they advance in years. Tree hardy, forming a large, round head, with large, glossy, rich, green foliage; exceedingly valuable for cooking; requires a rich, strong, heavy soil. Fruit large; color, rich yellow; flesh yellowish, tender, sub-acid. October to December.—*Elliott.*

48.—Hawthornden.—A beautiful Scotch apple, medium to large size, pale yellow and red. Trees have strong shoots, with low, spreading heads—constant and abundant bearers—excellent for cooking.—September and October. Resembles Maiden's Blush.—*E. and B.*

49. Haskell Sweet.—(Sassafras Sweet of Cole.)—Large, flat, greenish yellow; tender, sweet, and rich. Tree vigorous and productive. Massachusetts. September and October.—*Barry.*

50. Jewett's Fine Red.—An excellent New England apple, medium size, tender, and fine-flavored; a good grower and bearer—said to be well adapted to the North. Oct. and Nov.—*Barry.*



51. Hawley.—(Dowse.)—Very large, pale yellow, tender, rich, and fine, though sometimes defective. Tree a fair grower, and bears well.—September and October.—*E. and B.*

Fig. 6.—Hawley.

52. Jeffries.—From Chester Co., Pa. Tree moderate grower, upright habit, constant, abundant bearer; fruit roundish, flattened, pale yellow; flesh white, tender, crisp, juicy; "best." September and October. New.—*Elliott.*

Not much proved out of Pennsylvania.—*Annual Register.*

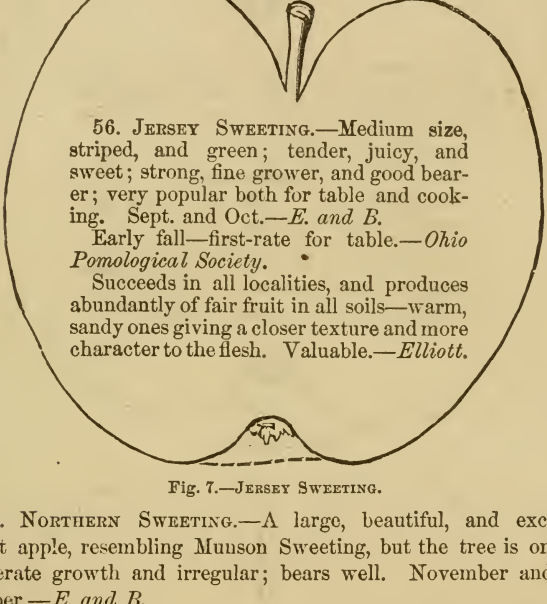
53. Lyman's Pumpkin Sweet.—(Pound Sweet.)—A large, round, green apple, fine for baking; tree very vigorous, upright, and productive. Much grown in Western New York. October to December.—*Barry.*

Very large—good for stock.—*Ohio Pomological Society.*

54. Leland Spice.—Rather large, roundish, red; flesh yellowish white, sub-acid, spicy, rich, fine flavor. A Massachusetts variety not much found elsewhere.—*Annual Register.*

55. Munson Sweeting.—Medium to large, pale yellow, with a

red cheek; tender, juicy, and good. Tree a very fine grower and good bearer. November and December.—*E. and B.*



56. JERSEY SWEETING.—Medium size, striped, and green; tender, juicy, and sweet; strong, fine grower, and good bearer; very popular both for table and cooking. Sept. and Oct.—*E. and B.*

Early fall—first-rate for table.—*Ohio Pomological Society.*

Succeeds in all localities, and produces abundantly of fair fruit in all soils—warm, sandy ones giving a closer texture and more character to the flesh. Valuable.—*Elliott.*

Fig. 7.—JERSEY SWEETING.

57. NORTHERN SWEETING.—A large, beautiful, and excellent sweet apple, resembling Munson Sweeting, but the tree is only of moderate growth and irregular; bears well. November and December.—*E. and B.*

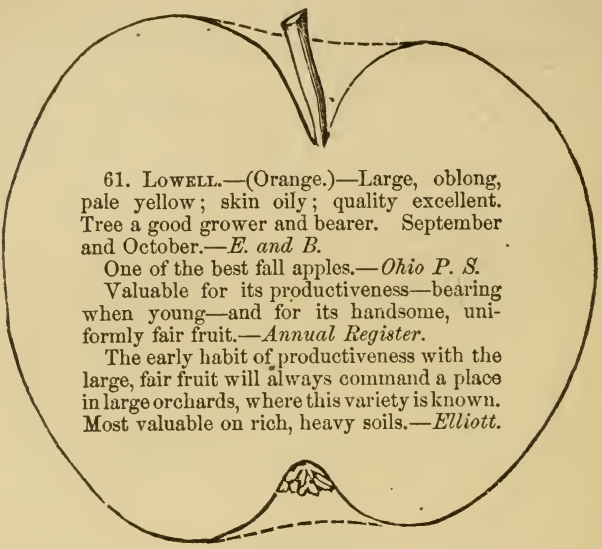
58. ORNE'S EARLY.—Rather large, somewhat ribbed; pale yellow; flesh white, very tender, juicy, and fine flavor. Early autumn.—*Thomas.*

59. POMME ROYAL.—(Dyer.)—Large, roundish, yellowish white, with a brown tinge next the sun; crisp, juicy, and high-flavored; tree a fair grower and abundant bearer. Sept. and Oct.—*E. and B.*

Tree a fair grower, moderately productive.—*Elliott.*

Fine in N. E. and N. Y. Bears when young.—*Annual Register.*

60. PRESIDENT.—Large and beautiful; yellow, with a red cheek; roundish flattened, of good quality; bears most abundantly. We obtained it from Columbus, O. October.—*Barry.*



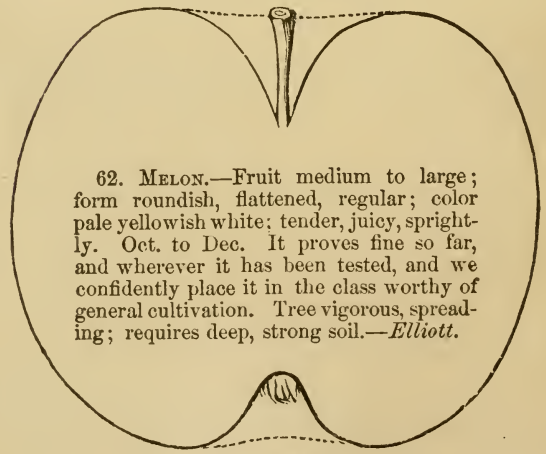
61. Lowell.—(Orange.)—Large, oblong, pale yellow; skin oily; quality excellent. Tree a good grower and bearer. September and October.—*E. and B.*

One of the best fall apples.—*Ohio P. S.*

Valuable for its productiveness—bearing when young—and for its handsome, uniformly fair fruit.—*Annual Register.*

The early habit of productiveness with the large, fair fruit will always command a place in large orchards, where this variety is known. Most valuable on rich, heavy soils.—*Elliott.*

Fig. 8.—Lowell.



62. Melon.—Fruit medium to large; form roundish, flattened, regular; color pale yellowish white; tender, juicy, sprightly. Oct. to Dec. It proves fine so far, and wherever it has been tested, and we confidently place it in the class worthy of general cultivation. Tree vigorous, spreading; requires deep, strong soil.—*Elliott.*

Fig. 9.—Melon.

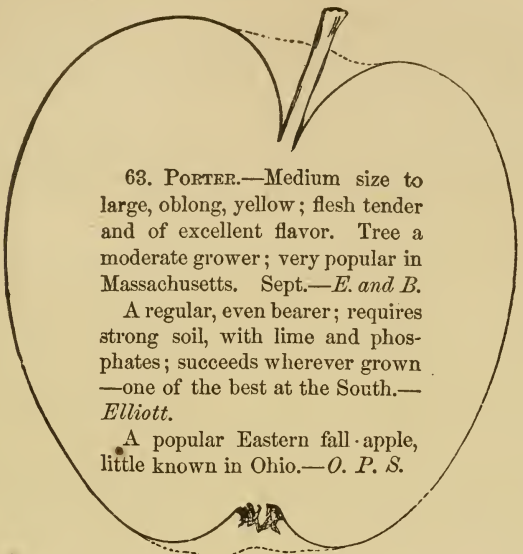

63. Porter.—Medium size to large, oblong, yellow; flesh tender and of excellent flavor. Tree a moderate grower; very popular in Massachusetts. Sept.—*E. and B.*
A regular, even bearer; requires strong soil, with lime and phosphates; succeeds wherever grown—one of the best at the South.—*Elliott.*
A popular Eastern fall apple, little known in Ohio.—*O. P. S.*

Fig. 10.—Porter.

64. Overman's Sweet.—Fruit medium, conical; pale yellow, striped with red; flesh white, juicy, sweet; "good;" baking. October and November.—*Elliott.*

This variety is from the orchard of Mr. C. R. Overman, Canton, Fulton Co., Ill.

65. Ross Nonpareil.—Tree productive. Fruit below medium, roundish, dull red, blotched and striped; flesh greenish white, juicy, sub-acid, aromatic; "very good;" nearly "best." October to November.—*Elliott.*

66. St. Lawrence.—Large, round, streaked, red and greenish yellow; a very beautiful, productive, and popular market apple from Canada. October.—*Ellwanger and Barry.*

"Very good."—*Elliott.*

67. Smokehouse, of Penn.; Vandervere, of Cincinnati, and

host of other synonyms.—Rather large, flattish; color a light dull red; rich, aromatic, sub-acid, of fine flavor. Growth crooked and spreading. Succeeds well in New York, and in the Middle and Western States.—*Annual Register.*

Subject to dry rot, when grown on soils deficient in lime; but when supplied with lime, the rot disappears, and the fruit increases in size and improves in quality. Needs good culture. Larger South than North.—*Elliott.*

68. Spice Sweet.—Large, pale yellow, with a blush on the sunny side, quite waxen and beautiful; tender, sweet, and fine; a good bearer. September.—*E. and B.*

Handsome and high-flavored.—*Ohio Pomological Society.*

69. Superb Sweet.—Large, roundish, yellow and red; flesh tender, juicy, rich flavored; tree is a good grower and bearer. September and October. Massachusetts.—*Barry.*

70. Tompkins.—A large and beautiful apple from Tompkins Co., N. Y. Golden color at maturity; flesh sub-acid, tender, and rich. Tree productive. October and November.—*Barry.*

CLASS III.—WINTER APPLES.

FIFTY VARIETIES.

71. Bailey Sweet.—Very large, deep red; flesh tender, rich, and sweet; a superb and excellent sweet apple. Originated in Wyoming Co., N. Y. Tree a vigorous, upright grower. November to April.—*E. and B.*

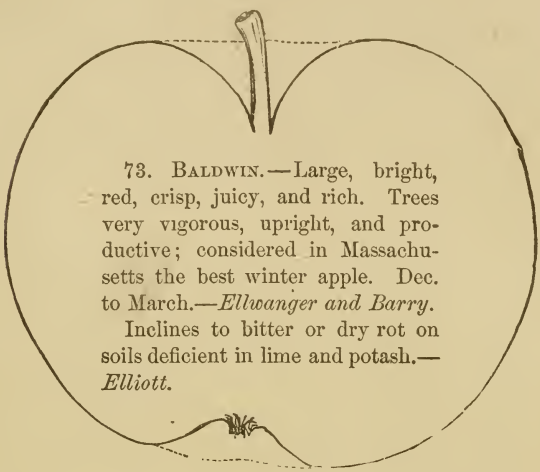
New—not much proved out of Western New York.—*Ann. Reg.*

Flesh yellow, rather dry, sweet; "very good."—*Elliott.*

72. Broadwell.—Tree vigorous, spreading, good bearer; medium to large, regular roundish, light yellow; flesh white, sweet, juicy. November to March.—*Elliott.*

Highly commended by Mr. Ernst and others from Cincinnati.—*Ohio Pomological Society.*

Sweet, juicy, and of fine flavor. A fine new Ohio variety.—*Annual Register.*



73. Baldwin.—Large, bright, red, crisp, juicy, and rich. Trees very vigorous, upright, and productive; considered in Massachusetts the best winter apple. Dec. to March.—*Ellwanger and Barry.*

Inclines to bitter or dry rot on soils deficient in lime and potash.—*Elliott.*

Fig. 11.—Baldwin.

Mr. Ernst quoted authority stating that when lime was used, this variety would always be free of rot—*Ohio Pom. Soc.*

It is a singular fact, that from Eastern Massachusetts, through New York and Michigan, the Baldwin is valuable and productive; but no sooner do we cross Lake Michigan than its value ceases. In Ohio and Illinois it is of little comparative value.—*North Western Fruit-Grower's Association.*

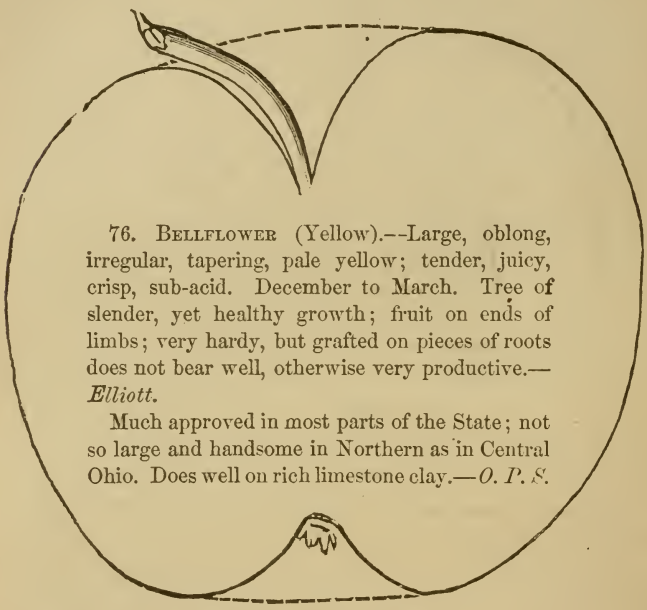
74. Bullock's Pippin (Golden Russet.)—Tree medium size, round head, admirably suited to rich soils. Fruit small to medium; roundish, golden yellow, soft russet; tender, juicy, almost buttery, delicate, sprightly. December to March.—*Elliott.*

Excellent and valuable throughout most of the Western States, but at the North and East often quite worthless.—*Annual Register.*

First-rate—not handsome.—*Ohio Pomological Society.*

75. Bourrassa.—Large, reddish russet, rich and high flavored; esteemed as one of the very best in Lower Canada, and in Maine and Vermont. October to March.—*Ellwanger and Barry.*

Succeeds finely in northern sections, on poor soil, etc. Sub-acid, "best."—*Elliott.*



76. Bellflower (Yellow).—Large, oblong, irregular, tapering, pale yellow; tender, juicy, crisp, sub-acid. December to March. Tree of slender, yet healthy growth; fruit on ends of limbs; very hardy, but grafted on pieces of roots does not bear well, otherwise very productive.—*Elliott.*

Much approved in most parts of the State; not so large and handsome in Northern as in Central Ohio. Does well on rich limestone clay.—*O. P. S.*

Fig. 12.—Yellow Bellflower.

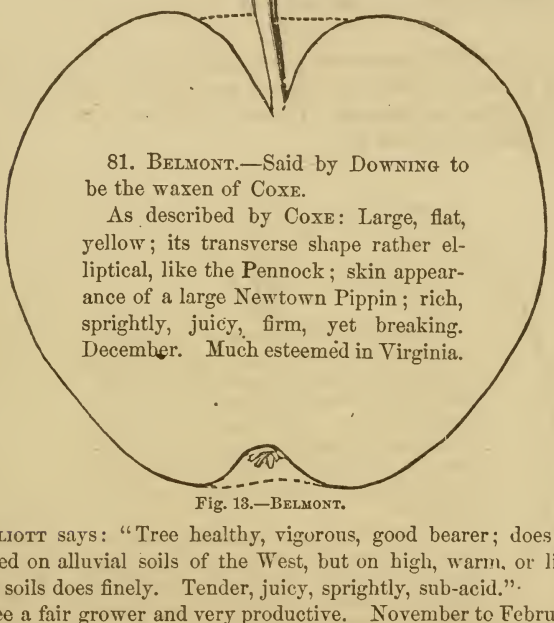
77. Blue Pearmain.—Very large, dark purplish red, covered with bloom; juicy and pleasant, sub-acid. Tree a vigorous grower, moderate bearer, and very popular in New England. October to January.—*E. and B.*

78. Baltimore.—Tree thrifty, slender, and very productive on warm, rich soils. Size medium to large, round; light yellow, striped with red; flesh white, tender, crisp, juicy, sub-acid. Dec. to March. Distinct from the Baltimore of Lindley.—*Elliott.*

79. Canada Pippin.—Tree strong, vigorous, upright, spreading, productive, very hardy; large, roundish, flattened; light greenish yellow; flesh yellowish white, crisp, tender, juicy, sub-acid, sprightly. January to May.—*Elliott.*

80. Challenge.—Tree productive, hardy; large, roundish, flat-

tened; rich yellow; flesh yellowish white, juicy, crisp, sweet, tender. October and November.—*Elliott.*



81. Belmont.—Said by Downing to be the waxen of Coxe.

As described by Coxe: Large, flat, yellow; its transverse shape rather elliptical, like the Pennock; skin appearance of a large Newtown Pippin; rich, sprightly, juicy, firm, yet breaking. December. Much esteemed in Virginia.

Fig. 13.—Belmont.

Elliott says: "Tree healthy, vigorous, good bearer; does not succeed on alluvial soils of the West, but on high, warm, or limestone soils does finely. Tender, juicy, sprightly, sub-acid."

Tree a fair grower and very productive. November to February. —*E. and B.*

In Northern Ohio is fine, and a good keeper; while south of Columbus it bears larger fruit, but not so finely flavored, and extremely liable to rot.—*Ohio Pomological Society.*

82.—Danvers' Winter Sweet.—Medium size, greenish yellow, with often a brownish cheek; tender, rich, and sweet. Tree vigorous and productive. November to March.—*E. and B.*

Succeeds well in Eastern and Middle States.—*Annual Register.*

Generally approved.—*Ohio Pomological Society.*

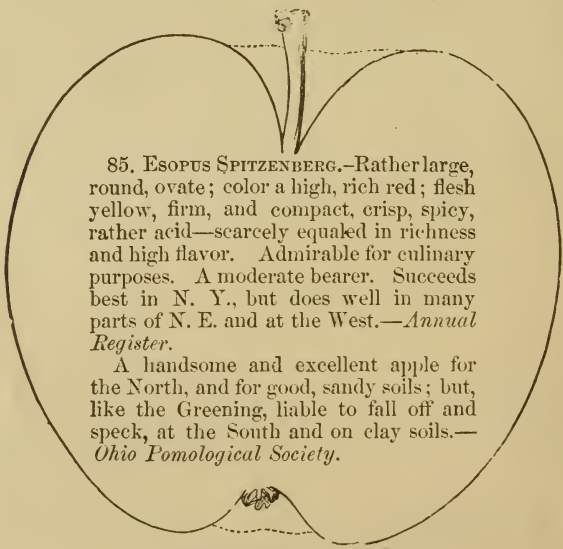
83. Dominie.—Medium size, flat, greenish yellow, streaked with red; sub-acid, juicy, and high flavored. Nov. to April.—*Barry.*

Early, good bearer; profitable orchard sort West; succeeding finely in most soils. "Very good."—*Elliott.*

Supposed to be the Wells of Ohio,—*Ohio Pomological Society.*

Quite productive and valuable.—*N. W. F. G. A.*

84. Dutch Mignonne.—A very large, beautiful, and excellent apple, a native of Holland; orange, marked with russet and faint streaks of red, fine flavored. Tree erect and good bearer. November to March.—*E. and B.*



85. Esopus Spitzenberg.—Rather large, round, ovate; color a high, rich red; flesh yellow, firm, and compact, crisp, spicy, rather acid—scarcely equaled in richness and high flavor. Admirable for culinary purposes. A moderate bearer. Succeeds best in N. Y., but does well in many parts of N. E. and at the West.—*Annual Register.*

A handsome and excellent apple for the North, and for good, sandy soils; but, like the Greening, liable to fall off and speck, at the South and on clay soils.—*Ohio Pomological Society.*

Fig. 14.—Esopus Spitzenberg.

86. Green Sweeting.—Medium size, greenish, tender, sweet, and spicy; one of the very best long-keeping sweet apples. Tree a moderate, erect grower. November to May.—*E. and B.*

We consider the Green Sweeting the best sweet apple that we grow in this locality; always fair, and of a handsome green color, rarely with a blush on one side. The tree is a good grower and bearer.—*Horticulturist.*

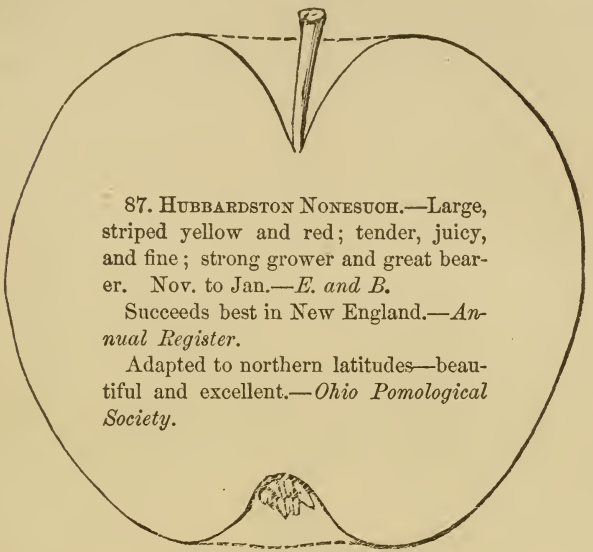

87. Hubbardston Nonesuch.—Large, striped yellow and red; tender, juicy, and fine; strong grower and great bearer. Nov. to Jan.—*E. and B.*
Succeeds best in New England.—*Annual Register.*
Adapted to northern latitudes—beautiful and excellent.—*Ohio Pomological Society.*

Fig. 15.—Hubbardston Nonesuch.

88. Herefordshire Pearmain.—Tree hardy, requiring rich, strong soil, when the fruit is of the highest excellence. Medium, roundish, conical; brownish red, mottled; flesh yellowish, tender, mild, sub-acid, aromatic. December to February.—*Elliott.*

89. Hartford Sweeting.—Medium, flat, striped; flesh juicy, tender, and rich. Keeps till late in spring; tree very productive; a valuable orchard variety.—*Barry.*

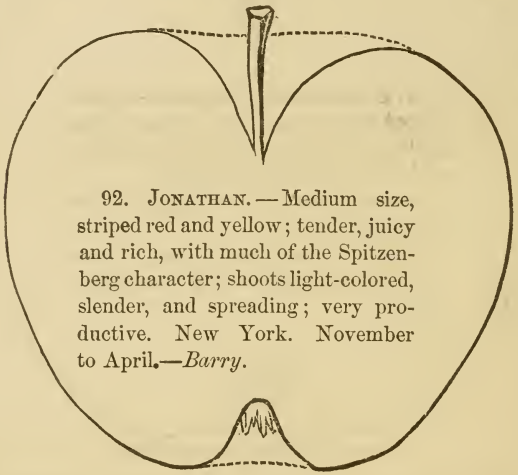
90. Lady Apple.—A beautiful little dessert fruit; flat, pale yellow, with brilliant red cheek; flesh crisp, juicy, and pleasant. The tree forms a dense, erect head, and bears large crops of fruit in clusters.—November to May.—*Barry.*

A profitable variety for city markets. On rich, clayey soils is apt to speck.—*Ohio Pomological Society.*

91. Limber Twig.—A large, dull-red apple, second-rate in quality, but keeps till June or July, on account of which chiefly it is

cultivated South and West. The tree has weak, pendulous branches, but is exceedingly hardy, and bears immense crops.—*Barry.*

A profuse bearer, and superior for drying.—*Ohio Pomological Society.*



92. JONATHAN.—Medium size, striped red and yellow; tender, juicy and rich, with much of the Spitzenberg character; shoots light-colored, slender, and spreading; very productive. New York. November to April.—*Barry.*

Fig. 16.—JONATHAN.

Some specimens from the West exceedingly beautiful.—*Thomas, in Annual Register.*

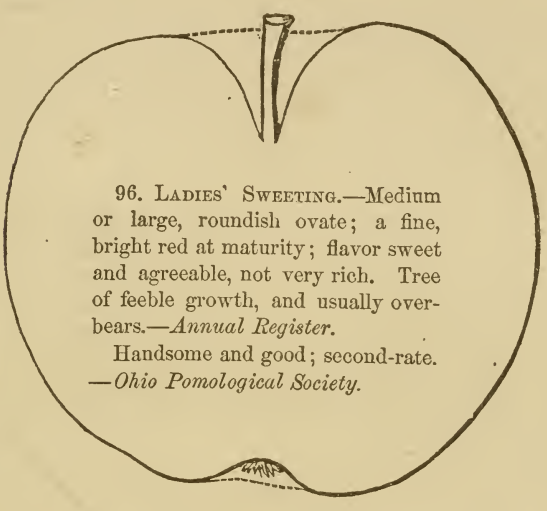
One of the handsomest and best of apples.—*Ohio Pomological Society.*

93. MONMOUTH PIPPIN.—Large, greenish yellow, with a fine red cheek; juicy, tender, and good. Tree erect, vigorous, and productive.—Keeps well till March and April.—*Ellwanger and Barry.*

94. MINISTER.—Large, oblong, striped greenish yellow and red; second quality. Tree vigorous and a great bearer. November to January.—*E. and B.*

95. MICHAEL HENRY PIPPIN.—Medium to large; roundish, conical, yellowish green, specks of russet. October to March. In extensive cultivation at the West, and very successful. Tree very productive.—*Elliott.*

Grown in Indiana under name of White Winter Pearmain.—*Ohio Pomological Society.*



96. Ladies' Sweeting.—Medium or large, roundish ovate; a fine, bright red at maturity; flavor sweet and agreeable, not very rich. Tree of feeble growth, and usually overbears.—*Annual Register.*

Handsome and good; second-rate.—*Ohio Pomological Society.*

Fig. 17.—Ladies' Sweeting.

97. Mother Apple.—Large, red, flesh very tender, rich, and aromatic. Tree a good bearer. Succeeds well in the North. November to January.—*E. and B.*

98.—Newtown Pippin.—It requires a rich limestone, clay soil, or a warm, sandy, rich loam, well dressed with lime and bone-dust. Fruit medium, roundish, oblong, flattened; when ripe, a yellowish green; flesh greenish white, juicy, crisp; Feb. to May.—*Elliott.*

Trees of slow growth—bark rough. Often scabby, unless with high culture. Succeeds well in New York and the West.—*A. R.*

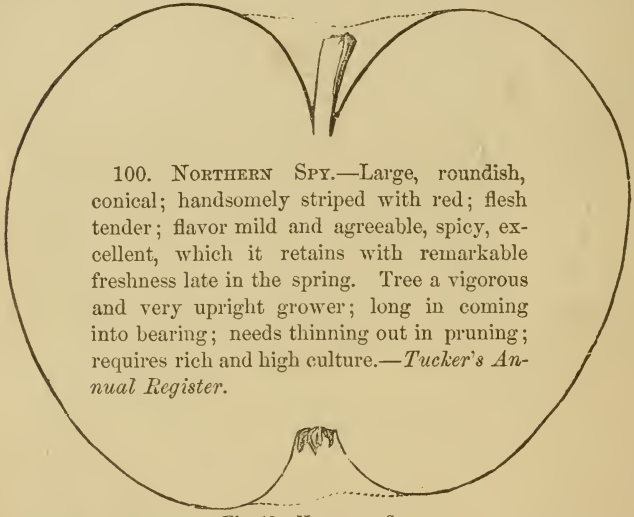
Gen. Worthington thought this and some other old kinds are losing their health and vitality.—*Ohio Pomological Society.*

99. Ortley.—(White Bellflower or White Detroit.)—Large, roundish, slightly oblong, pale yellow; flesh sub-acid, sprightly, and fine; succeeds well in New Jersey and in the West.—*Barry.*

In strong, rich soils, throughout the entire Western States, it

proves one of the hardiest, most productive, profitable, as well as best varieties known.—*Elliott.*

One of the best apples adapted for strong soils at the South and West.—*Ohio Pomological Society.*



100. Northern Spy.—Large, roundish, conical; handsomely striped with red; flesh tender; flavor mild and agreeable, spicy, excellent, which it retains with remarkable freshness late in the spring. Tree a vigorous and very upright grower; long in coming into bearing; needs thinning out in pruning; requires rich and high culture.—*Tucker's Annual Register.*

Fig. 18.—Northern Spy.

Considered of doubtful value in Ohio.—*Ohio Pomological Soc.*

While the quality of this variety secures it a place among first-class fruit, it can not be considered a profitable variety until the trees have acquired at least twenty years of age, as it is tardy in coming into bearing.—*Elliott.*

101. Ohio Nonpariel.—Tree straight, stout growth, compact head; annual bearer; fruit large, roundish, flattened; red and yellow marbled and splashed; flesh yellowish white, tender, juicy, sub acid; "best." October to December. New.—*Elliott.*

102. Peck's Pleasant.—Large, pale yellow, with a brown cheek, very smooth and fair; flesh firm and rich, approaching the flavor of a Newtown Pippin. Tree erect and a good bearer. November to April.—*E. and B.*

Generally esteemed as a first-rate apple.—*Ohio Pom. Society.*
A good bearer; fruit always fair.—*Annual Register.*

103. Phillips' Sweeting.—Native of Ohio. Growth vigorous, upright; wants strong, heavy soils. Fruit medium to large; roundish, conical, slightly flattened; yellow, mottled with red; tender, juicy, crisp. December and January.—*Elliott.*

Large, handsome, and good.—*Ohio Pomological Society.*

104. Pomme Grise.—Small, grayish russet, very rich and high flavored; tree a moderate grower, but good bearer; very valuable in the North.—*E. and B.*
Good bearer, tree of small size. Fruit below medium, roundish; yellow gray or russet; flesh yellow, tender, sprightly; December to February.—*Elliott.*

105. Rawle's Jaunet.—(Neverfail.)—Medium to large size; yellow, striped with red; crisp, juicy, rich; a prolific bearer. One of the longest keepers and best apples in the South and Southwest. —*E. and B.*
In quality it is only second-rate, and at the North is not desirable; but south of Cincinnati is highly so, and it succeeds where many others fail.—*Elliott.*
"Very good," not "best;" profitable in most localities.—*North-Western Fruit-Grower's Association.*

106. Rome Beauty.—A large and very beautiful new apple, of Ohio. It is roundish, or very slightly conical; pale yellow, mostly covered with bright red; flesh not very fine, but tender, juicy, and good. Early winter. It will undoubtedly be valuable for the orchard.—*Barry.*

107.—Rambo.—Medium size, streaked and mottled, yellow and red, tender, juicy, and mild-flavored. Tree a good grower and bearer. A widely-cultivated and esteemed old variety. Autumn in the South; October to December in the North.—*E. and B.*
"Best," very productive and profitable.—*N. W. F. G. A.*

108. Reinnette, Canada.—Very large, flattened, ribbed, dull yellow, flesh firm, juicy, and rich. Tree a strong grower and good bearer. November to March.—*Barry.*

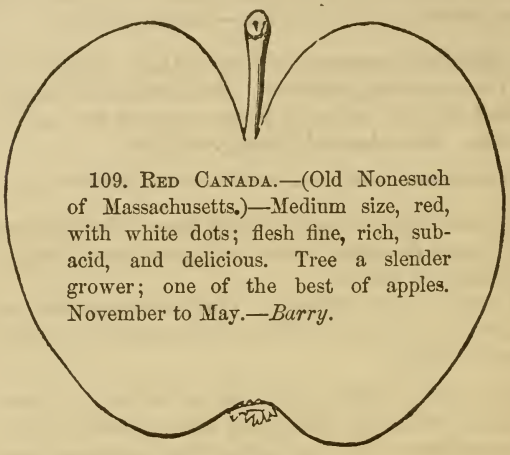

109. Red Canada.—(Old Nonesuch of Massachusetts.)—Medium size, red, with white dots; flesh fine, rich, subacid, and delicious. Tree a slender grower; one of the best of apples. November to May.—*Barry.*

Fig. 19.—Red Canada.

110. Rhode Island Greening.—Large, roundish, oblate; green, becoming greenish yellow, always fair, a dull brown blush to the sun; flesh yellow, tender, juicy, with a rather rich acid flavor. Growth strong, best on light soils, very productive.—*Thomas.*

Testimony has shown that it is a gross feeder, and needs soil well drained, rich in lime and phosphates. On usual soils, when the variety is defective, liberal dressing with wood ashes will answer.—*Elliott.*

A great and constant bearer in nearly all soils and situations.—*E. and B.*

Not sufficiently proved at the West yet, but does not promise so well there. —*Annual Register.*

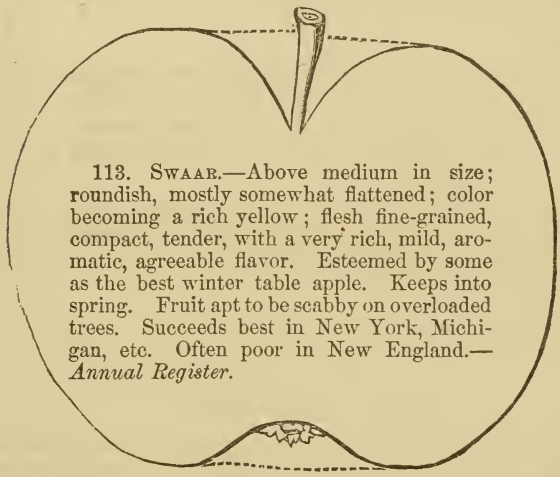
Root-grafted trees were uniformly unproductive. A few had found it to bear well budded or stock-grafted.—*N. W. F. G. A.*

In many localities at the West the Greening, like some others of the older varieties, has not as yet succeeded well. Perhaps, with the cultivation suggested by Elliott, it may yet be found to answer better.

111. Ribston Pippin.—Large, striped yellow and red; crisp,

juicy, and sprightly. Tree spreading and productive. October to November.—*E. and B.*

112. Roxbury Russet.—Medium to large; surface rough, greenish, covered with russet; flavor indifferent; tree vigorous, spreading, and a great bearer; keeps till June. Its great popularity is owing to s productiveness and long keeping.—*Barry.*



113. Swaar.—Above medium in size; roundish, mostly somewhat flattened; color becoming a rich yellow; flesh fine-grained, compact, tender, with a very rich, mild, aromatic, agreeable flavor. Esteemed by some as the best winter table apple. Keeps into spring. Fruit apt to be scabby on overloaded trees. Succeeds best in New York, Michigan, etc. Often poor in New England.—*Annual Register.*

Fig. 20.—Swaar.

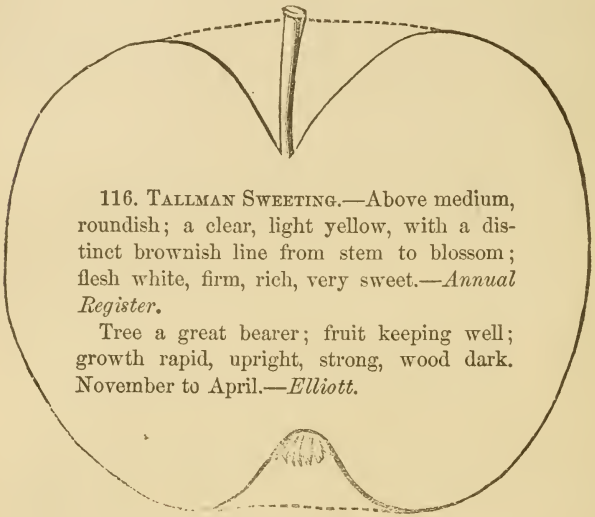
On the rich prairie soils of the West it is said to succeed, proving a good bearer and profitable.—*Elliott.*

Generally productive—quality of the highest character.—*North-Western Fruit-Grower's Association.*

114. Tewkesbury Winter Blush.—Small, yellow, with a red cheek; flesh firm, juicy, and fine flavored; a remarkably long keeper; tree a rapid, erect grower. Suits the South best, as it requires a long season to mature it. Origin New Jersey. January to July.—*E. and B.*

115. Vandevere.—Medium size, yellow, striped with red, and becoming deep crimson next the sun; flesh yellow, rich, and fine·

tree a fair grower and good bearer; succeeds best on light, warm, dry soils. October to March.—*E. and B.*



116. Tallman Sweeting.—Above medium, roundish; a clear, light yellow, with a distinct brownish line from stem to blossom; flesh white, firm, rich, very sweet.—*Annual Register.*

Tree a great bearer; fruit keeping well; growth rapid, upright, strong, wood dark. November to April.—*Elliott.*

Fig. 21.—Tallman Sweeting.

117. Winter Pearmain.—Medium size, dull red stripes on a yellowish ground; flesh tender, pleasant, and aromatic; a moderate grower and bearer; best on warm soils. November to March.—*E. and B.*

118.—Wine-Sap.—Fruit medium, ovate, conical; a bright, clear red, stained and spotted with yellow; juicy, tender, sub-acid. October to March. The tree is hardy, an early and very productive bearer, producing fair, fine fruit in all soils; fine on dry prairies.—*Elliott.*

Constant in productiveness, and of fine quality.—*N. W. F. G. A.*

119. Wine Apple.—(Hay's Winter.)—Large, roundish, slightly flattened; yellow striped and clouded with bright red; flesh yellow, juicy, crisp, and pleasant. A native of Delaware; succeeds well in many parts of the country.—*Barry.*

120. Westfield Seek-No-Further.—Medium to large, striped with dull red, and slightly russeted; flesh tender, rich, and excellent; tree a good grower and bearer, and fruit always fair. November to February.—*Ellwanger and Barry.*

121. Yellow Newtown Pippin.—Trees, though of slender growth, good bearers, and apparently perfectly at home in rich limestone soils. Keeps till June.—*Elliott.*

ADDITIONAL VARIETIES.

The following list of additional varieties, gleaned from various sources, doubtless contains many that are worthy of very general cultivation, and none that have not in certain localities, and in certain soils, with proper cultivation, been pronounced valuable:

Adams,
Albemarle Pippin,
Aromatic Carolina,
Autumn Bough,
—— Pearmain,
—— Seek-No-Further,
Bailey Sweet,
Belle et Bonne,
Belzer,
Beauty of Kent,
Bentley's Sweet,
Bean Sweet,
Black Apple,
Blenheim Orange,
Borsdorfer,
Bledsoe,
Blood,
Borovitzky,
Brabant Bellflower,
Brooke's Pippin,
Buffington's Early,
Burr's Winter Sweet,
Bush,
Carnahan's Favorite,
Cannon Pearmain,
Cann Apple,
Campfield,
Carolina Winter Queen,
Cayuga Redstreak,
Cole,
Coe's Golden Drop,
Cooper's Early White
Court-pendu Plat,
Cumberland Spice,
Cracking,
Cat Pippin,
Darlington,
Delight,
Detroit Red,
Dunlap's Aurora,
Dillingham,
Dutch Codlin,
Early Jack,
—— Pennock,
Emperor,
English Golden Russet,
—— Sweeting,
Esten,
Eustis,
Fall Jennetting,
—— Queen,
—— Cheese,
Fallenwalder,
Father Abraham,
Foundling,
Ferdinand,
Franklin Golden Pippin,
French's Sweet,
Fort Miami,
Flushing Spitzenberg,
Fulton,
Gabriel,
Garden Royal,
Genesee Chief,
Gilpin,
Giles,
Golden Noble,
Gloucester Cheese
Gray Vandevere,
Groveland Sweet,
Green Sweet.
—— Seek-No-Further,
Granniwinkle,
Grindstone,
Hagloe,
Harrison,
Haskill Sweet,
Hector,
Harkness' New Favorite,
Herman,
Hooker,
Hunter,
Jabez Sweet,
Jefferson,
Jersey Pippin,
Jewett's Fine Red,
June Apple,
July Branch,
Kane,
Kenrick's Autumn,
King Apple,
King of Pippins,
Kaighn's Spitzenberg
Lancaster Greening,
Late Queen,
Laquier (Lackeer),

Lake,
Ledge Sweet,
London Pippin,
Long Stem (of Brinckle),
Long Stem (of Cole),
Loring Sweeting,
Male Carle (Charles Apple),
Michael Henry Pippin.
Melvin Sweet,
Moore,
Monarch,
Monk's Favorite,
McLellan,
Musk Spice,
Mifflin King,
Myer's Nonpareil,
Newark Pippin,
Northern Golden Sweet,
Orange,
Orndorf,
Oldtown Crab,
Osborn's Fall Sweet,
Osceola,
Paradise Winter Sweet,
Paragon,
Peach Pond Sweet,
People's Choice,
Pennock, or Big Romanite,
Pfeiffer,
Princess Royal,
Pumpkin Russet,
Pryor's Red,
Progress,
Quince (of Cole),
Ragan,
Randall's Best,
Raritan Sweet,
Red Cardinal,
—— Quarrenden,
—— Sweet,
Rosseau,
Republican Pippin,
Reinnette, Seedless,
—— Triumphant,
Roman Stem,
Selma,
Seever's Red Streak,
Schoonmaker,
Scallop Gilliflower,
Smith's Cider,
Summer Hagloe,
Spring Pippin,
Stanard's Seedling,
Stroat,
Sturmer Pippin,
Striped Pearmain,
Sugar Sweet,
Sweet Bellflower,
—— Baldwin,
Sweet Pippin,
—— Wine-Sap,
—— Pearmain,
Spice Russet,
Tetofsky,
Virginia Greening,
Waddell's Hall,
Walworth,
Walpole,
Wagener,
Wells' Sweeting,
Wells' (Winter Redstreak)
Western Spy,
Wetherell's White Sweeting
Whitewater Sweet,
White Seek-No-Further,
—— Juneating,
—— Winter Calville,
—— Spanish Reinnette,
—— Rambo,
Winter Cheese,
—— Harvey,
Willow Twig,
William Penn,
Winslow,
Wing Sweeting,
Yost,
Yacht,
York Imperial.

CLASS IV.—CRABS.

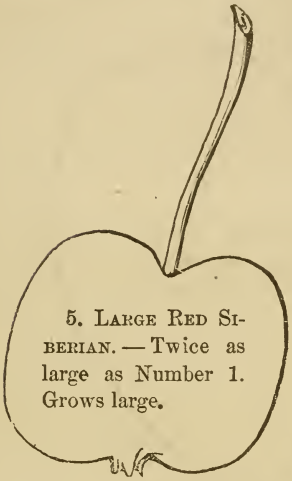
ORNAMENTAL.

1. Red Siberian.—Inch in diameter, tree erect; bears at two or three years.

2. Yellow Siberian.—Yellow—about as large as No. 5.

3. Large Yellow Siberian.—Larger than No. 3; tree a vigorous and rapid grower.

4. Double Flowering Chinese.—A beautiful ornamental tree, producing large clusters of semi-double rose-colored blossoms.



5. Large Red Siberian. — Twice as large as Number 1. Grows large.

Fig. 22.—Large Red Siberian.

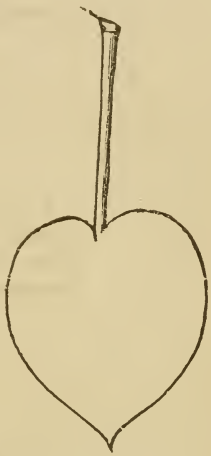


Fig. 23.—Cherry Crab.

6. Cherry Crab.—Small, round, red.—*E. and B.'s Catalogue.*

Fig. 24.—Astrachan, or Evergreen Apple Crab.

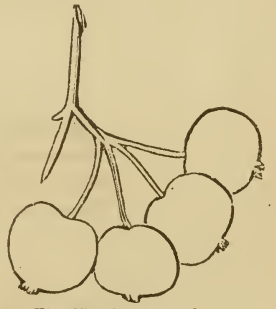


Fig. 25.—Currant Crab.

7. Astrachan, or Evergreen Apple Crab.—Fruit deep green, speckled with white dots; leaves evergreen, remaining on the tree all winter.

8. Currant Crab.—Fruit like the currant, and hang in clusters. Ornamental in fruit and flowers.

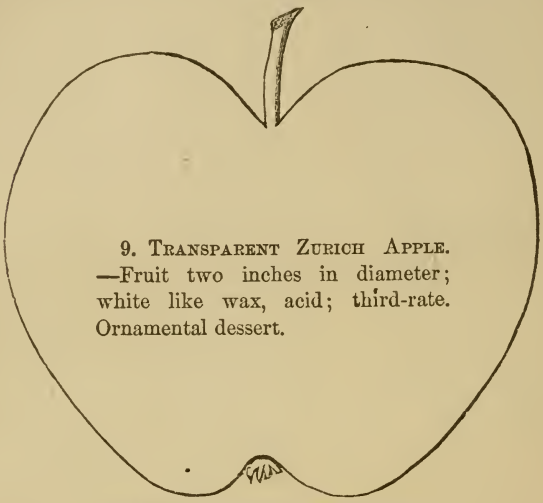


Fig. 26.—Transparent Zurich Apple.

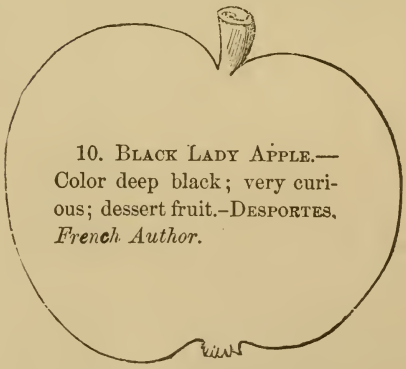


Fig. 27.—Black Lady Apple.

These crabs, with their beautiful blossoms and handsome red and yellow fruit, are very desirable for ornament in a fruit garden or small orchard; and all who love the beautiful in nature, and wish

to adorn their homes, should procure a few of the different varieties. Some of the larger sorts are also useful, as well as ornamental, being esteemed by many for preserving. They are generally early bearers, and very prolific.

SELECTION OF VARIETIES.

There are very few individuals who do not, before planting an orchard, seek the advice of some one as to what varieties they should procure; and many in this way are induced to plant trees which are not worthy a place in any collection. It is a very difficult matter to procure just such trees, and those alone as will certainly be best adapted to the wants of the planter, and to the character of the soil in his particular locality. Trees that succeed well in one kind of soil, are sometimes almost worthless in others; while, again, others seem to flourish almost equally well in all kinds of soil. Of the one hundred and twenty-one varieties described in the foregoing list, there is not perhaps one that has not been tested and known to succeed in several localities distinct and remote from each other; and not one but may be regarded as valuable for a specific use. Yet there are many degrees of excellence, and some of these uses are much more important than others.

The safest and best plan for the new beginner everywhere, is to consult his own neighborhood in the choice of varieties. Let him first carefully note the character and conditions of his own soil, and then spend a day or two among his neighbors examining the character of their soils; looking a little, also, into their style of planting, modes of culture, etc., and from these draw his conclusions. If, on soils similar to his own, he finds that a given variety has done well—tree healthy and thriving, and fruit abundant—let him select that for his own planting, of course paying due regard to quality of fruit. If another has failed, or produced poor results, let him reject it. In this way, by the exercise of a sound judgment, many expensive mistakes may be avoided. Other sorts may be added to complete the list.

A reliable and honest nurseryman—and none other should ever be dealt with—can generally give important aid to the planter in the selection of varieties, and frequently does to his great advantage.

INSECTS AND DISEASES.

Some of the insect enemies of the apple have become much more formidable than formerly. Of these the three most conspicuous and troublesome, over a large portion of the country, are the borer, the canker worm, and the codling moth. Of the first named there are two sorts—the flat-heads and the round-heads—whose work is much the same; the one working generally high up in the stem of the tree, and the other about the collar and the roots near the surface of the ground.

A wash made of tobacco, sulphur, and soap-suds, applied in the spring, after digging away the earth from the trunk of the tree, has been used with great success. A mound of ashes placed around the tree in the winter, and allowed to remain until after the hatching of the eggs in early summer, is a good preventive. When fairly in and at work in the wood, the best remedy is to find their holes and kill them with some sharp instrument—an awl or a piece of wire. They should be most carefully guarded against, and sought for when they have made a lodgment. In some localities they have been very destructive.

The canker-worms are not so well known, though at times very numerous and very destructive. They sometimes infest orchards by millions and hundreds of millions, and if not checked will almost completely strip it of its foliage. Whole orchards will sometimes present an appearance similar to that caused by a fire passing through it.

The codling moth, or apple-worm, is the most destructive insect with which the orchardist has to contend. Its depredations cost the country many millions annually. Hence it should be the duty of every fruit-grower to learn something of its nature and habits, in order that its depredations may be counteracted or averted. The following will give the uninitiated some knowledge of the insect:

These moths pass the winter in the pupa state, in cocoons, under the loose bark of the tree, or in such crevices as they can find about the apple barrels or bins. It is a question whether they ever enter the ground to remain over winter, as has been supposed by some.

They appear in the spring as moths about the time of the opening of the apple blossoms, the time varying in different latitudes and in different years.

As soon as the apple is out of the blossom, the moth begins to

deposit its eggs in the calyx or blossom end, usually one at a time and one to each apple. This is believed to be almost invariably done in the night. The animal itself, being small, and a brownish color, is very seldom seen. These eggs hatch, in about a week, a very minute whitish worm, with black head and collar, which eats its way gradually into the core of the apple. The apples containing worms can usually be distinguished by the adherence of the castings of the worm to the calyx, in the form of a small dark tuft. Many, but not all, of the wormy apples fall to the ground, some before and some after the worms have matured and passed out. They generally leave the apple through the side, through a larger hole than the one by which they entered; but sometimes by the same, at the calyx end.

The length of the lives of these insects, it has been found by close observation, to be about as follows: Egg state, one week; larva state, four weeks; pupa state, two weeks; imago or moth state, one week—eight weeks in all. Favorable or unfavorable circumstances may lengthen or shorten each of these periods.

It is now generally known that there is a second brood, in localities south of forty-one or two degrees, which survives the winter, and is ready for another raid when the mild weather of spring brings them out. Many individuals of this brood leave the apples after they have been gathered, and secrete themselves in the crevices of the barrels or bins in which they are stored.

It is understood that each female moth will deposit from fifty to sixty eggs in as many apples. It can thus readily be seen that, with two broods in a season, even one of these moths may commit a great deal of havoc in an orchard before the season closes, and the great necessity existing to use the utmost vigilance in their destruction.

They can be destroyed. With the foregoing facts well understood, the intelligent orchardist will readily discover some modes by which their numbers can be materially lessened. These methods are several—more or less successful. Dr. Le Baron, State Entomologist for Illinois, enumerates four methods, thus:

"Destroying the insects in their winter quarters. Picking the wormy apples from the trees. Gathering the wormy apples from the ground, or letting swine and sheep have the range of the orchard. Entrapping the worms in bands and other contrivances."

As all of these modes are important, we will consider them separately. We have seen that they go into winter quarters and spin their cocoons under the rough bark of the trees, in the crevices of the bins or barrels in the cellar, or any similar hiding-place that is conveniently reached. We have seen, also, that one female moth will lay from fifty to sixty eggs—perhaps twice that number; hence it is obviously important that as many of them as possible should be destroyed before leaving their quarters in the spring. Hence we receive much aid from the birds—wood-peckers and sap-suckers—which employ the winter very industriously in pecking holes in loose bark, and otherwise searching for and destroying them. Any one who will take the trouble to examine his trees in the spring, will find numerous holes through these scales of bark, made by the bills of these birds, and will see that one of these insects has disappeared from the opposite side. But the birds don't find them all. We must search for and destroy the remainder, if we would be exempt from their ravages. The bins and barrels must be searched; the bark of the trees must be examined. All the loose bark should be scraped off in the early spring and burned. But with all the search we are likely to or can make, and with all the aid the birds give us, many of them will escape capture, and will come forth in the spring full fledged moths, ready to begin their work of destruction as soon as the young apple is ready.

The next step is to destroy the wormy apples. Those containing worms can readily be distinguished by the rust-colored castings adhering to the calyx or blossom end, where the egg was deposited. To remove these apples before the worms have left them, and feed them to hogs, or otherwise destroy the worms, is a matter of first importance. Any expedient that will be cheap and effective should be resorted to. It should be remembered that, for every apple so picked and worm destroyed, of this first brood, the parent of at least fifty or sixty later ones is put out of the way. In a small orchard, the removal of almost all the wormy apples stung by the first brood can be effected, and it is a question whether what will pay with a few trees will not also pay in the case of many.

To wait for the apples to fall and be eaten by animals is well as far as it goes; but as many of the worms leave the apples before they fall, and many of them soon afterwards, it will be seen that a large portion would escape destruction. An examination of wind-

falls will show that, in a large proportion of cases, the worms have gone. Less than half, it is presumed, are thus caught by waiting until the apples fall.

The fourth and last method mentioned—that of entrapping the worms—is believed to be the most effectual. But little success has ever attended efforts to catch the parent moths. They are nocturnal in their habits, and not one man in a dozen has ever seen one in his orchard. They are shy and not easily entrapped. They have been tried with lamps and with fire; they have been tortured with stench and with smoke; they have been tempted with molasses, and sweetened water, and vinegar; and while other insects yield to the seductions, the codling moths, with rare exceptions, reject them all.

The worms, on leaving the apple, immediately seek some place of shelter, where they can wind their cocoons and go into the pupa state, and (if late in the season) go into winter quarters. Hence the theory of the use of bands around the trees. Every man's ingenuity will suggest material out of which these bands can most profitably be made. Hay and straw, twisted into ropes about an inch in diameter, and wound twice around the trees and tied, as in binding sheaves, make very good shelters for them. But better still, a band three or four inches in width, made from old cloth, and so tied with a cord as to offer them a protection beneath.

But old clothes are not always to be had in sufficient abundance for a large orchard. Sheets of thick and strong brown paper, cut into four-inch strips and tied, would probably be as good and cheap substitutes as any. They can at least be easily and quickly handled, but would not last more than one season.

But these bands, it should be remembered, will be worse than useless unless they are frequently examined and the larva destroyed. They should be put on in say twenty days from the falling of the apple-blossoms; afterwards they should be examined at least monthly. The last examination should be after the crop is gathered, or may be deferred till winter.

Other modes may suggest themselves to the intelligent cultivator, and every mode should be put into requisition that will destroy a moth and save an apple.

The Bark Louse—is a little brown insect, which appears sometimes in great numbers on the bark of the tree and branches, and lives upon the sap.

They may be destroyed by a decoction of tobacco-juice and soap-suds, applied by dipping or sprinkling with a syringe. They may be removed from the body and large limbs by scraping. A mixture of lime, soap, and water is also a good remedy.

Elliott says: "A good wash for all insects is made of—say five gallons of weak ley, one pound powdered sulphur, and four ounces soot, or lampblack, thoroughly mixed."

A solution of aloes is good to protect trees from vermin—so says Raspail.

The Caterpillar.—In some seasons these pests have been very destructive to the apple-tree—so much so as to almost destroy whole orchards. Their eggs are usually deposited in the fork of a limb, or near the ends of the branches, in clusters, where they remain all winter, and hatch early in the spring. At first they are not larger in circumference than a pin, but continue growing till they reach the size of a small pipe-stem, and two inches in length—living meanwhile upon the foliage, which by the middle of summer will be entirely stripped from the tree.

To destroy them, cut away and burn the small branches which hold them during the winter, or before they begin to crawl in the spring; or if this has been neglected, brush them off with a swab saturated with soap-suds, or lime-water, or spirits of ammonia. A brush made of rough tow, grass, straw, or old woolen rags, and attached to the end of a pole, and turned a few times in their nests, will remove them. If a few escape and migrate to other branches or other trees, and build new homes, they must be treated in the same manner. The swabs should be burned after being used.

The Blight.—This is a disease for which no satisfactory cause seems yet to have been discovered. It attacks generally the ends of the branches all over the tree alike.

As no cause has been discovered, no certain remedy has been proposed. Recourse must be had to the knife. Cut away all the affected branches, as low as the disease has appeared, and burn or otherwise destroy them. Continue the process, if necessary, until

the whole tree is cut away. Trees in good soil, and kept in a proper state of cultivation, will not be so subject to attacks of the Blight as those otherwise situated.

Ants—are sometimes very troublesome about fruit-gardens, by making their hillocks among the trees. The plow or hoe will generally compel them to find other quarters, but not always. They may be extirpated by pouring boiling water in upon them. If they infest the ripening fruit, as they sometimes do, catch them by suspending an open bottle in the tree, partly filled with syrup or molasses—then destroy them.

Rabbits—are very destructive to young orchards and nurseries, by gnawing the bark, especially during the snows of winter. They eat the bark for food.

The trees must be protected by tying split corn-stalks, or small strips of bark, or shingles around the body, or by wrapping them carefully with wisps of twisted straw, to the height of two feet or more.

Mice—will also frequently injure the bark of trees near the base, especially if any grass or straw in which they can shelter has been allowed to remain there.

To keep them away, heap a mound of dirt around each tree in the fall, to the depth of ten or twelve inches, and allow it to remain till spring.

Chapter Four.

THE BLACKBERRY.

This is one of the best fruits for the table, and popular in all markets and among all classes of people; and is certainly deserving of much more attention than it has heretofore received as a garden fruit. The remark of the farmer whose fields were overgrown with briers, and who refused to allow his neighbors to pick the berries, because, as he alleged—"If they had not been so lazy, they might have had blackberries of their own," will in time cease to be a joke; for they will be obtained by industry and cultivation, instead of neglect and waste.

There are varieties to be found, no doubt, in many localities, which, by careful and judicious culture and management, might almost be made to rival the celebrated New Rochelle or Lawton Blackberry. That, it is said, was originally transplanted from the roadside to the garden—and high cultivation did the rest.

The Blackberry is propagated by layers and by seeds. It is rather hard to transplant, which may be mainly owing to the fact that its habits have not yet become sufficiently understood. It abounds in a rich and mellow, and rather damp soil; flourishes in its wild state mostly by the side of old logs or stumps, or around stone heaps, or in the corners of fences, or any place where large quantities of leaves or other vegetable mold abounds.

The two varieties most cultivated in the United States at the present time are the

Improved High Bush.—Introduced into notice by Capt. Lovett, of Beverly, Mass. "The berry is long, egg-shaped, shining black, juicy, and rich; the plant erect, blossoms white; ripens at a most timely season—after the raspberry." Capt. L. has produced them an inch and a half long.

Fig. 28.—Improved High Bush.

New Rochelle, or Lawton Blackberry.—This has been for several years cultivated in and about New Rochelle, N. Y., and was first brought to public notice by Mr. William Lawton, of that place.

Fig. 29.—New Rochelle Blackberry.

In a description of it in a late Patent Office Report, he says: "The New Rochelle Blackberry sends up annually large and vigorous upright shoots, with lateral branches, all of which, under common cultivation, will be crowded with fine fruit, a portion of them ripening daily, in moist seasons, for six weeks. They are perfectly hardy, always thrifty and productive; and I have not found them liable to blight

or injury by insects. Except that they are perfectly hardy, and need no protection in winter, the cultivation may be the same as

KITTATINNY.

the Antwerp raspberry ; but to produce berries of the largest size, they should have a heavy, damp soil, and shade."

Ever since the introduction of the Lawton, cultivators have been seeking for new varieties—the aim being to obtain a better and a hardier sort—for, notwithstanding the claim put forth in the foregoing extract, the Lawton *is not* sufficiently hardy to withstand the hard winters north of Philadelphia, Cincinnati, and St. Louis. Of later sorts—

THE KITTATINNY, which originated near Philadelphia, has been widely disseminated, and claim is made that it is a hardy variety. It is of excellent quality, very sweet and large, though not quite so large as the Lawton, and ripens a little before it.

WILSON'S EARLY.—This is another later introduction, very good and productive, large and long, and ripens early. About as hardy as the foregoing.

MISSOURI MAMMOTH.—This blackberry originated in north Missouri, and has been persistently disseminated as a superior variety. It is larger than any of the sorts named, and about equal in quality to the Lawton ; but does not promise well for hardiness. In that respect not any superior to the former.

WESTERN TRIUMPH.—A variety originating somewhere in Illinois. Not sufficiently tested to justify extensive planting.

CRYSTAL WHITE.—With nothing to recommend it but its name ; and it is very far from being a white blackberry. It is bitter, small, and worthless—and the wonder is that nurserymen will continue it in their catalogues.

THE SNYDER.—This is a new variety, put forth with strong claims for its value as a hardy sort. Said to stand the winters where most of the varieties above named have failed. It is prolific, but of only small or medium size. It promises well, though its hardiness must be its chief recommendation.

CULTIVATION AND MANAGEMENT.—For field culture the blackberry should be set in rows, not less than eight feet apart and three to four feet in the rows. Care must be taken that the roots do not become exposed to the sun or atmosphere before planting. The stem of each plant should be cut back to four or six inches—just sufficient left to facilitate handling. If well planted, the new shoots from the roots will begin to show themselves in two or three weeks. Not more than two or three of these should be

allowed to grow the first year, and the ground should be frequently stirred, and kept free of weeds and grass. If the soil is rich and mellow these shoots will grow stout and stocky, and reach a height of four or five feet by fall. But it is best to pinch off the terminal shoot of each plant when it reaches a height of three or three and a half feet—thus causing it to throw out side-shoots and form a bushy top.

Of course no fruit can be obtained the same year of planting. The growth of this season will bear a crop the next, and then die—thus renewing themselves annually. While one season's growth is bearing fruit, another growth is coming forward to take its place; and as soon as the fruit is gathered, the stalks that bore it should be carefully cut away to make room for the new growth.

Some cultivators allow the stalks to grow tall and slender, without nipping back. These tall stalks require support, and if they are not staked or trellised, will be apt to blow over by the wind. Those that are shortened, and made to grow stocky, will support themselves, and require no outlay for trellis or stakes. Besides, the quantity of fruit is largely increased by this mode of treatment.

Blackberries are rank feeders. Barn-yard manure, freely given them in the fall, acts as a protection in the winter and a fertilizer in the season of growth; while leaves, rotten-wood, or straw make a mulch well suited to their natural habit.

An acre of ground, planted at the distances named, will grow from one thousand to twelve hundred hills, and after the second year should yield fifty or sixty bushels, at a moderate estimate. Care and judgment in management, good cultivation, and a free use of mulching and fertilizing material, will be sure to bring their reward.

Chapter Five.

THE CHERRY.

The Cherry will do well on almost any dry soil, but that quality is indispensable—it must be *dry*. Few soils are sufficiently dry without artificial draining.

In the richer class of soils, cherries should only be cultivated in the spring and early summer—never later than August, as late culture induces second growth and immature wood, incapable of withstanding the rigor of the succeeding winter.

Pruning should be done in July—some recommend March. As a standard tree, the cherry should be pruned but little—only to cut away the decayed, crooked, or deformed limbs.

VARIETIES.

1. American Amber.—Medium size, amber color, delicious. Vigorous and productive. First of July.

2. Black Heart.—An old sort; black, large, tender, rich, prolific. First of July.

3. Black Eagle.—Large, black, juicy, high-flavored, productive. First of July.

4. Belle de Choisy.—Medium, amber, tender, sweet, and rich; rather a shy bearer. End of June.

5. Belle Magnifique.—Magnificent, large, red, juicy, tender, rich. Slow grower; profuse bearer. Last of July.

6. Bigarreau., or Yellow Spanish.—Large, pale yellow and red, firm, juicy, delicious. One of the best. Vigorous and productive.

7. Buttner's Yellow.—Medium, pale yellow, crisp, juicy, sweet. Vigorous and productive. Its peculiar and beautiful color makes this sort desirable. End of July.

Fig. 30.—Black Tartarian.

8. Black Tartarian.—Very large, purplish black, tree erect and beautiful, immense bearer. One of the most popular varieties in all parts of the country. First of July.

9. Burr's Seedling.—Large, pale red, delicious. In luxuriant foliage, stateliness of growth, and productiveness it surpasses even the Black Tartarian.

10. Black Hawk.—Large, firm, black, resembling Black Eagle.

11. Buttner's Morello.—Medium, red, acid; valued for its lateness.

12. Cleveland Bigarreau.—Large, red and yellow, sweet and rich; spreading and productive. Early.

13. China Bigarreau.—Medium; oval, red speckled, sweet, and rich. Vigorous, profuse bearer. Valuable. July.

14. Carnation.—Large, light red and orange, tender, rich, acid. Profuse bearer—very valuable. Last of July.

15. Coe's Transparent.—Medium, pale amber, tender, sweet, fine. Tree vigorous and erect. End of June. New.

16. Downton.—Creamy white and red, tender, and fine-flavored. Rapid grower. Ripens with Black Tartarian.

17. Delicate.—New, rich, juicy, sweet. Medium, amber, yellow. Thrifty and productive.

18. Donna Maria.—Medium, dark red, tender, juicy, rich. Tree small, very prolific. Middle of July.

19. Downer's Late Red.—Rather large, light red, tender, juicy, vigorous and productive. Middle of July.

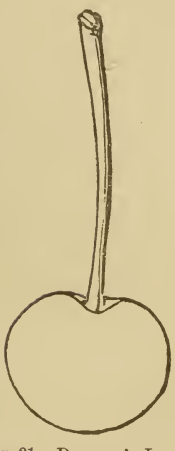


Fig. 31.—Downer's Late Red.

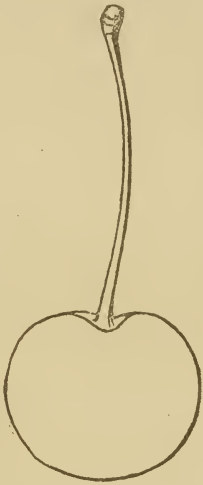


Fig. 32.—Governor Wood.

Fig. 33.—Iocosot.

20. Early Richmond.—Early, red, acid—for cooking. June.

21. Elton.—Large, pointed, pale yellow and red, juicy, and rich. Tree vigorous and irregular. End of July.

22. Early Purple Guigne.—Medium, purple, tender, juicy, and sweet. Growth slender and spreading.

23 Governor Wood.—Large, round, light red, tender, juicy, sweet, rich. Middle of June. Vigorous and productive while young.

24. Gridley, or Apple Cherry.—Medium, dark brown, firm, sprightly, sub-acid. Immense bearer. Last of July.

25. Indulle, Nain Precoce.—Earliest of all cherries. Last of May. Dwarf in habit, quite prolific.

26. Iocosot.—Large, rich, glossy, almost black, tender, juicy, rich, sweet. Last of June. Thrifty—productive. New.

27. Kennicott.—Large, amber yellow, mottled with red; firm, juicy, rich, and sweet. Middle of July. Vigorous, hardy, very productive.

28. Kirtland's Mary.—Large, round, red on yellow ground; firm, rich, juicy, sweet, very high flavored. Strong grower, very prolific. First of July.

29. Kirtland's Mammoth —Mammoth size, clear yellow, marbled with rich red; juicy, sweet, high flavored. Moderately productive. Last of June.

30. Knight's Early Black.—Large, black, tender, juicy, rich. Very productive. Last of June.

31. Large Heart-Shaped Bigarreau.—Large, dark, shining brown, rich, and excellent. Vigorous, spreading—middle of July.

32. Monstreuse de Mezel.—Very large, dark brown; vigorous, late—middle of July. New—French.

Fig. 34.—Kirtland's Mary.

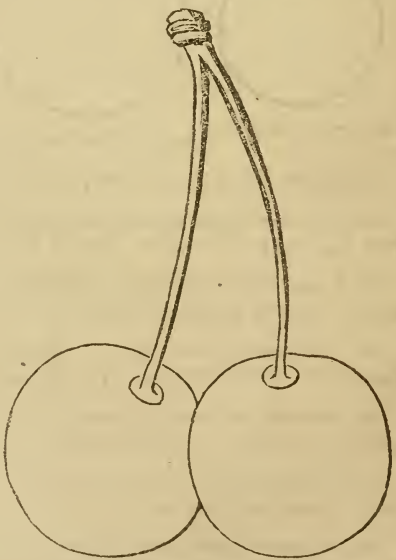


Fig. 35.—Monstreuse de Mezel.

33. Manning's Mottled.—Large, amber shaded, tender, sweet, delicious. Vigorous and productive. End of June.

34. May Duke.—An old and excellent sort; large, dark red, juicy, sub-acid, rich. Hardy and fruitful—fine for dwarfs and pyramids. June and July.

35. Morello, English.—Large, dark red, nearly black; juicy, sub-acid, rich. Tree small and slender. August. Valuable.

36. Pontiac.—Large, dark, purplish red, juicy, sweet, agreeable. Last of June. Tree vigorous and productive.

37. Powhatan.—Medium, rich purplish red, marbled, juicy sweet, pleasant. Middle of July. Vigorous and productive.

38. Napoleon Bigarreau.—Largest size, pale yellow and red, juicy and sweet. Vigorous grower and enormous bearer. First of July.

39. Red Jacket.—Large, light red, juicy, good flavor. Middle of July. Hardy, very productive.

40. Reine Hortense (Monstreuse de Bavay).—Large, bright, juicy, delicious. Tree vigorous and bears well. Good for pyramid—new—French.

41. Tecumseh.—Large, reddish purple, juicy, sweet, not high flavored. Middle of July. Vigorous and hardy.

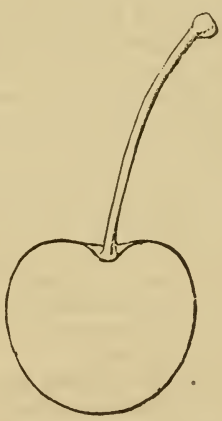


Fig. 36.—Napoleon Bigarreau

42. Tradescant's Black Heart.—Very large, black, firm, juicy, good. Tree vigorous, a great bearer Last of July.

Great interest was taken, some years since, in the production of new varieties of cherries, and Prof. Kirtland of Cleveland, Mr. Downer of Kentucky, and others, contributed many new sorts of positive value. Some of them have been extensively propagated and planted, and in ordinary seasons have given good satisfaction. But a few severe winters have convinced growers that most of them

lack the necessary quality of hardiness, and they cannot be relied on, except in certain favored localities.

Many foreign sorts have also been introduced, some of them of very great excellence; but with most of these the result has been the same—the changeableness and severity of our climate being too great for them. So that it is now considered unsafe to plant any other than those that have been proven to be of the hardiest sorts. Quality has come to be regarded as a secondary consideration in planting a cherry orchard for profit. Yet for family use, and for amateur planting, these finer sorts should not be entirely discarded. Some of those possessing a high excellence as table cherries are sufficiently hardy, in sheltered situations, to give fair results; but great care should be observed in their selection.

The Early Richmond (also known as Kentish and Early May) and the Common, English, and Plumstone Morellos, are regarded as the most hardy of all the cherry family, and most at home in our climates. These usually bear good crops, North as well as South; and, besides being hardy in wood, are less liable to the depredations of insect enemies. These four varieties will give a succession of several weeks. For table use these sorts are not so desirable as some of the sweeter sorts, but for canning and for cooking are regarded as far preferable.

The mode of working finer sorts upon the Common Morello, by top-grafting, has been introduced and practiced, to a considerable extent, with good success; but only the slow-growing kinds should be thus used. The Early Richmond has been thus grafted, and is said to produce fuller crops than on its own roots—why, it might be hard to determine, as it is considered about equal in hardiness with the Morello.

The chief objection to this mode of propagation lies in the fact that the Morello is liable to sucker from the roots, and in this respect it is not desirable as a stock.

For orchard culture the cherry may be planted twenty feet apart; but in garden plats, as good a way as any is to set them along the fence row. It is now conceded that, after a few years of good culture, the cherry will bear better crops when allowed to grow in a grass sod than with cultivation—it being requisite that the needed fertilizers shall be supplied and that the soil be well drained.

Chapter Six.

THE CURRANT.

This fruit rejoices in a moist, cool climate, and yet, with proper cultivation, is made to succeed admirably in most parts of our country.

The currant is easily raised, and is a most valuable fruit. Its pleasant, acid flavor makes it a favorite with all classes, and the great variety of modes in which it can be served up, together with the season of its ripening, renders it almost indispensable.

The currant is best propagated by cuttings. These should be ten or twelve inches long, of the straight and firm last season's growth, and should be cut just below their union with the old wood. With a sharp knife cut away all the buds from that portion of the cutting designed to be under ground, leaving only two or three buds above the surface. In this way the growth of suckers may be prevented. The cuttings should be obtained and set as early in the spring as it is possible to get the ground in readiness.

The soil should be deep, mellow, and rich. The cuttings should be inserted about one half their length into the earth, if they are long, or two thirds if short, by means of a dibble or sharp instrument, and the loose mold pressed firmly around them with the hand. They should then have a good mulching of old straw or leaves, or other suitable material, to the depth of three inches or more. The cuttings should be ten or twelve inches apart, in rows two feet distant.

In the following spring they may be transplanted. Make the rows wide enough apart to admit of cultivation with a plow, and put the plants one yard apart in the rows.

The currant is naturally a suckering plant, and it will succeed better in this way, throwing up new shoots annually, than if trained to a tree form, as has been recommended by some.

Cut away the three-year-old branches, thus keeping the necessary supply of new bearing wood. Each fall the mulch of the preceding summer should be forked in, and a heavy supply of good manure added. The currant can not easily be overfed.

The rows should be renewed once in five or six years, as the young and vigorous trees will be more productive than the old, and will yield better and larger fruit.

The currant may be easily trained against a wall or fence in the following manner: When a cutting just transplanted begins to grow, rub off all the shoots on the stem except such as may be necessary to give it the proper shape—say three, one for a vertical position, and the others for laterals. In the spring following, train these in the direction desired, and observe the same care in regard to side shoots, allowing only a sufficient number to grow to give the tree a proper form. And so on, from year to year.

An annual pruning and shortening in is necessary to insure good fruit.

VARIETIES.

1. Black Naples.—A very superior black currant, of fine flavor, bearing the largest-sized berries in large clusters. Very productive.

2. Knight's Sweet Red.—Mild and pleasant, resembling the White Dutch in quality, and the Red Dutch in color, but not so deeply colored.

3, 4. Red and White Dutch.—Good size and mild flavor, and quite productive.

5. May's Victoria.—Known also as Houghton Castle. Bunches very long, berries large and pale red. A good bearer. Fruit hangs long on the bushes.

6. Cherry Currant.—The largest of all red currants. Quite sour, branches short. Vigorous grower and abundant bearer. Very valuable.

7. White Pearl.—New—described as growing in long bunches, and being of a pearl color.

8. White Grape.—A very large, white sort; bunches large,

berries closely set; pale, transparent. Very distinct from other white sorts. A great bearer.

9. Red Grape.—Long branches; berries large, light red. Good grower, good bearer.

10. Champagne.—New variety, color light pink.

11. Prince Albert.—A very large, light red; late, distinct variety; an immense bearer, very valuable.

12. Missouri Large Fruited.—Large, violet fruit. Immense bearer. Grows to large bushes.

13. Missouri Sweet Fruited.—Blue color, sweet, late. Great bearer, large bush.

14. Silver Striped.—Red fruit, silver-stripe foliage; curious.

There are many new varieties of the currant, but since the introduction of the Victoria, the Cherry, and the White Grape, it is doubtful if there has been any improvement. Indeed, the old reliable Red and White Dutch are claimed still by many to be equal to any of their successors. The Black Naples is one of the hardiest varieties, and peculiarly free from insect enemies and diseases. It has an offensive, musky odor, which repels the insect depredators, and its fruit is highly impregnated with the same. Many persons discard it on that account, but to those who relish it, the Black Naples is one of the richest and most healthy of the currant varieties. Excellent for cooking.

Give the currant good soil, good culture, and plenty of manure. Mulch plentifully. Keep the old and decaying branches well thinned out, and the new growth shortened to two-thirds.

Use powdered hellebore, or some other preventive against the depredations of the currant-worm and the borer, and seek out and destroy the latter whenever he makes a lodgment.

The currant, although usually much neglected, will, as well as any other, repay its owner for good care and attention.

Chapter Seven.

THE GOOSEBERRY.

The gooseberry is propagated in the same manner, and requires much the same general culture as the currant—excepting that, as it is a gross feeder, it requires a deeper and richer soil.

Trench two feet deep, and fill in the bottom a heavy dressing of fresh stable manure. Place the rows five feet apart, and the trees three feet apart in the rows. Keep off all shoots from the roots, and trim to a single stem, from twelve to thirty inches high, and keep the head well thinned out, but do not cut off the ends of the young shoots. Free access of air and light is necessary, but no shade. A writer in the *Vermont Chronicle*, in reference to the high-bush mode of training, says:

"I have one six feet high. This places your fruit out of the way of hens, and prevents the gooseberry from mildewing, which often happens when the fruit lies on or near the ground, and is shaded by a superabundance of leaves and sprouts. It changes an unsightly bush, which cumbers and disfigures your garden, into an ornamental dwarf tree. The fruit is larger, and ripens better, and will last on the bushes, by growing in perfection, until late in the fall."

Mildew.—The chief drawback to the culture of the gooseberry in this country is, that the fruit is so liable to mildew. This is supposed to be caused by a superabundance of heat, and too little moisture in the atmosphere. Good culture will, in an eminent degree, remedy this evil.

High, open culture, free manuring, and copious mulching are the best known remedies. Sawdust, or spent tan bark, makes a good mulch for the gooseberry. It should be applied liberally—to a depth of at least four to six inches. Hay, or other mulching material, sprinkled occasionally with common salt, is likewise good.

Hog manure, to the depth of three inches beneath each tree, has been found highly beneficial. Sprinkling with ashes when the dew is on has had a good effect on the fruit to prevent mildew. Frequent sprinkling with soap-suds, early in the spring, has a fine effect on the growth of the bush, and is a good preventive of mildew.

To prevent gooseberries from mildewing, remove the dirt from about the roots, thickly mulch with salted meadow hay, and then cover again with earth. This mode is recommended by R. T. HAINES, Elizabethtown, N. J.

VARIETIES.

Fig. 37.—HOUGHTON'S SEEDLING.

1. HOUGHTON'S SEEDLING.—This is inferior in size to many of the English varieties, but has been found to be less affected with mildew than any other; it is also a most excellent fruit, and generally productive, and for these reasons is perhaps more worthy of general cultivation, especially at the West, than any other variety. It was produced by Mr. ABEL HOUGHTON, of Lynn, Mass., and is a cross probably between some English variety and our native fruit of the woods. Its flavor is sweet and delicious, and in cooking qualities stands unrivaled. Color pale red.

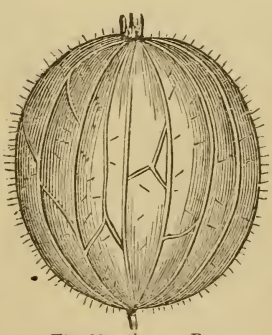


Fig. 38.—CROWN BOB.

2. CROWN BOB.—Very large, red fruit; spreading branches; flavor of the best.

3. ROARING LION.—Branches drooping; fruit large, red, and hangs long.

4. SHEBA QUEEN.—Large, white fruit, good flavor, erect branches.

5. WHITESMITH.—Large, often over an inch in length; very productive; color white and bluish. Very erect habit.

There are several newer varieties of the gooseberry, but none of them can be claimed as superior to the Houghton. The Downing and the American Seedling are perhaps its equal, and in some localities preferred. The chief fault with all the American sorts is in their small size—none of them approaching the magnificent English varieties, such as Crown Bob, Whitesmith, and Sheba Queen.

The cut scarcely does justice to the Houghton Seedling. Good culture, thinning out of old wood, and high manuring, producing fruit one-third larger than represented.

The great trouble with the gooseberry, in our climate, is its tendency to mildew. For this reason the English sorts have been almost entirely discarded. The aims of cultivators have heretofore been to produce new sorts not subject to mildew. Success has not entirely crowned their efforts, though nearly so. And now what is wanted is a gooseberry as large as the Crown Bob, and as hardy and productive, and as free from mildew as the Downing or Houghton.

In the meantime let the large English sorts not be entirely forsaken. A free use of shade, heavy mulching and manuring, severe thinning out, and plenty of salt and moisture, may save the crop. Or try the tree or high-bush form, as recommended by the correspondent of the Vermont *Chronicle*—using salt and sulphur directly upon the fruit.

We can conceive of no more valuable accession to a fruit garden than a show of these truly magnificent red, yellow, and green gooseberries—if they can be had!

For canning, the gooseberry is one of the most valuable of fruits. It is prepared with little expense and trouble; is easily kept; is excellent for pies and tarts; is very healthful, although so very sour that it requires a large quantity of sugar to render it palatable.

Rev. E. P. Roe, of Cornwall-on-the-Hudson, Orange Co., N. Y., has a seedling gooseberry of great promise. In its native home it is perfectly hardy and healthy, and free from mildew, and very prolific. It will be tried elsewhere, and should it succeed in other places, it will be a great acquisition.

Fig. 19.—Roe's Seedling.

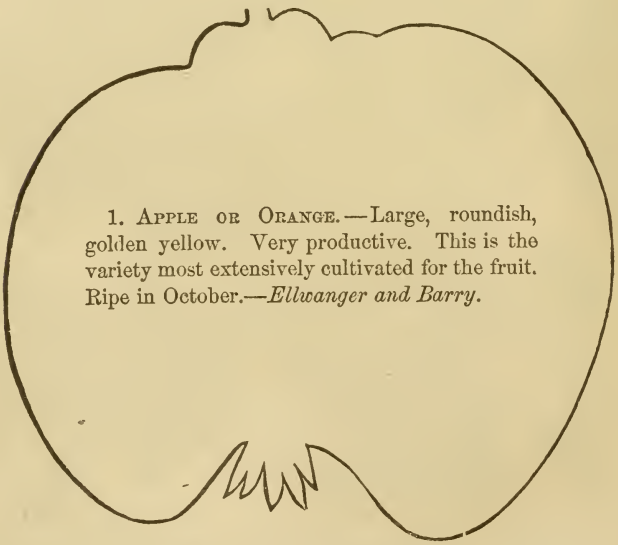
Chapter Eight.

THE QUINCE.

The quince is a valuable, but much neglected fruit. It is not eaten raw, which accounts for its being so generally neglected by the majority of people. It is valuable for preserving, and for making marmalades, jellies, etc. It is also good for drying.

Quinces should be gathered by hand, and with care, so as not to bruise or indent them, then wrapped in paper, and kept in a cool room.

VARIETIES.



1. Apple or Orange.—Large, roundish, golden yellow. Very productive. This is the variety most extensively cultivated for the fruit. Ripe in October.—*Ellwanger and Barry.*

Fig. 40.—Apple or Orange Quince.

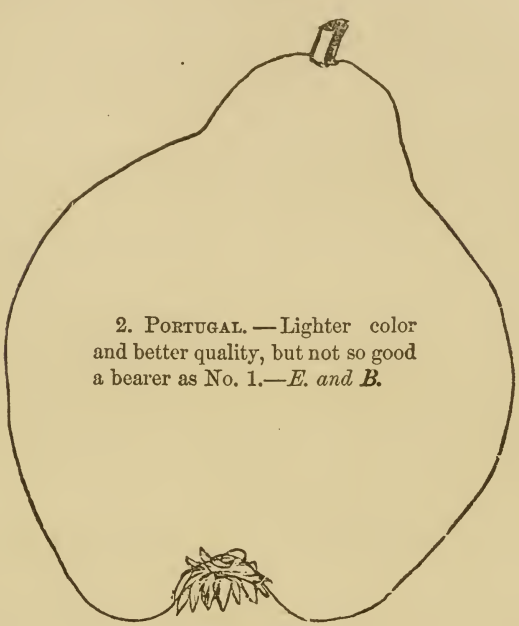


Fig. 41.—Portugal.

Soil, etc.—For the quince a moist soil and shade are very generally recommended; but where a proper quantity of manure is used, and the proper cultivation given, these are not essential. The soil should be deep and rich, and large quantities of barn-yard manure should be mixed with the soil, together with an abundance of salt. Liquid manures are also valuable on the quince.

Transplanting—may be done either in fall or spring, but the the former is generally preferred. Before transplanting, quinces should be freely pruned, cutting back—say one half or two thirds of last year's growth. The tree should be left with a low head, the stem not more than one or two feet long.

Good and thorough cultivation and free manuring will accomplish more, perhaps, for the quince than for any other fruit. Neglect your trees, and your fruit (if so fortunate as to have any) will

be rough and stunted in growth; give them an abundance of food and culture, and they will repay you with a profusion of large, smooth, and golden fruit. Plant ten to twelve feet apart each way.

Insects.—The following remedy for the borer is taken from Thomas' *Fruit Culturist:*

"The borer sometimes proves a formidable enemy. It is the larva of an insect which attacks the wood of the trunk near the surface of the ground, and works inward, usually upward, but sometimes downward, to a distance of several inches into the wood during the summer season.

"As the borer frequently destroys the tree, various means of prevention have been resorted to. The remedies described for the apple-borer are found useful. When the insect has once obtained possession, the best method appears to be direct attack. Scrape the soil from the trunk, and cut with a knife lengthwise, and not across the bark and wood, till the insects are found. Repeat the operation once a week for several times, as a part escapes the first examination. Then cover the wounded parts with a mixture of warm tar with ochre or brick-dust."

There are one or two other varieties of this fruit, seedlings of the above, for which greater excellence is claimed, and are worthy of a trial.

The Angers Quince is a variety from France, used not for its fruit, but for a stock on which to dwarf the pear.

Quinces are but little planted in any section of the United States This neglect arises chiefly from the fact that they are generally regarded as non-productive. As usually grown, they certainly do not bear well; but it is believed that in the proper soil, and with good cultivation, they will yield as well as most other kinds of fruit.

Chapter Nine.

THE NECTARINE.

The nectarine in its nature and habits very much resembles the peach, from which it differs but little, but mostly in the smoothness of its skin. The same culture and general management is requisite for both. It is peculiarly liable to the attacks of the curculio, and on that account full, well-ripened crops are rare. Yet it is usually a prolific bearer, and, could the ravages of its great enemy be prevented, it would soon become a common and highly valued fruit.

VARIETIES.

Those most worthy of general cultivation are—

1. Early Violet.—Medium size, purplish red, very fine flavor. Last of August.

2. Elruge.—Medium, greenish yellow, fine flavored. First of September.

3. Downton.—Medium, pale green and violet; excellent.

The above have been recommended by the American Pomological Society as worthy of general cultivation. The following are also regarded by some societies and cultivators as equally worthy of attention:

4. Boston.—Large, handsome, yellow and red.

5. Hunt's Tawny.—Small, dark red, early.

6. Early Newington.—Large, pale green and red, juicy, rich.

7. Hardwicke Seedling.—Small, orange red, juicy. August.

8. Late Melting.—White and red, very late.

9. French Yellow.—Medium, greenish yellow, rich. September.

10. Orange.—Large, orange; rich and fine. September.

11. Red Roman.—Greenish red; rich and good. September.

12. Large Early Violet.—Larger than No. 1, but not so good

The Nectarine so nearly resembles the Peach in its habit and growth of tree, and in its foliage, bloom, and fruit, that few persons can detect the difference. Its diseases and insect enemies are also the same. Hence one description will answer for both; and the reader is referred to the chapter on the peach, for a description of the insects and diseases common to both.

The great destroyer of both, and of the plum and the apricot, is the curculio. But its ravages are greater in the nectarine than peach, from the fact that the former has a smooth skin, and offers less resistance to the sting of the insect while depositing its eggs. In locations where this insect has not penetrated, and where the climate is favorable to the growth of the fruit, it may do to plant nectarines. Or amateurs, or market gardeners, who have the energy to fight the enemy to the bitter end, may plant with some assurance of success. All others had better leave this fruit out of their catalogues.

Chapter Ten.

THE PEACH.

The peach, in all climates suited to its growth, is the most common and easily obtained of the whole family of fruits. It is to be found in the orchard and door-yard of every one who attempts the

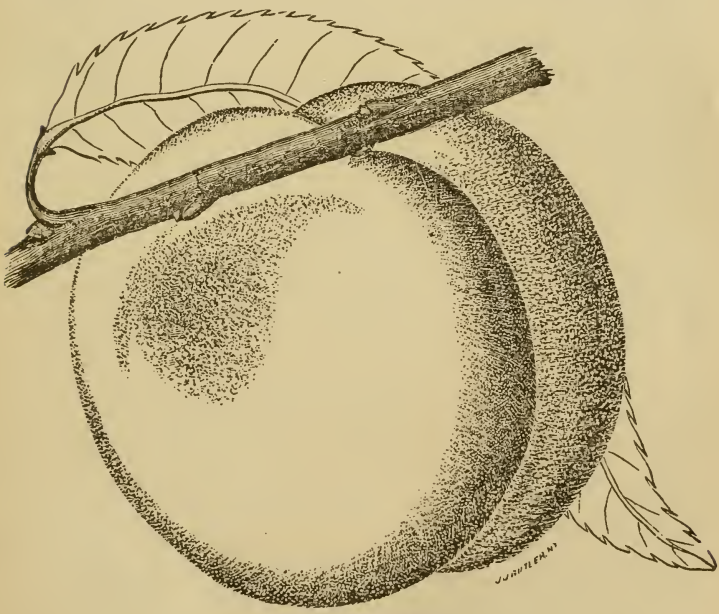


Fig. 48.—The Peach.

cultivation of fruits at all—and yet how little care and attention is bestowed upon it! It grows and yields its annual supply with

very little culture; yet extra labor and skill are always with it most amply rewarded in its increased size, excellence, and beauty.

The peach will usually bear in quite cold weather, even to 20 or 25 degrees below zero, unless the buds have been previously swollen by warm weather in the fall, or unless succeeded immediately by warm sunshine. Trees that have grown in improper soil, or are otherwise in an unhealthy condition, will be more liable to have their fruit killed by frost.

The chief food of the peach are lime, potash, and bone-dust; consequently on soils where these are naturally in abundance, or where they are plentifully supplied, may it be expected to produce the largest crops of healthy and vigorous fruit.

Trees thus fed, and kept properly trimmed and cultivated, will live longer than those not so favorably circumstanced.

Peaches are easily propagated from the seed. If the stones or pits be properly planted in the fall, they will usually sprout in the spring. To succeed well, take the stones before they have become dry, and cover them in a pile to a depth of four to six inches, in light, sandy soil. Here they will freeze and crack open during the winter, and on the return of spring, and by the time the ground can be made fit to receive them, they will be found to have germinated. Take them carefully up, and plant in rows four or five feet apart, and ten or twelve inches in the row, covering them about two inches deep with rich pulverized soil. By keeping the ground well cultivated during the summer, and clear of all grass and weeds, they will reach a height of three to five feet by the first of Sept.

A few of the stones, when raised in the spring, will be found not to have cracked open; these must be opened by using a hammer, taking care to strike them on the edge, and not on the end, or flatwise; otherwise they will be injured. Plant these in rows separate from the others, as it is desirable to have all in the same rows as near one size as possible—and those will not be likely to grow as large as the others.

Those trees which have reached a proper growth should be budded the same year—in August or early September. Many transplant the seedling trees, either because it is considered too expensive to procure the budded ones, or because they are thought to be as valuable, or from want of proper reflection on the subject. It is true that, in some instances, nearly the same fruit as that from the

parent tree is thus produced; this is oftener the case with the yellow-fleshed varieties than any others. Yet it is far better to plant only the best, even at four times the cost, than to plant the seedling tree. He who does so will surely gain in the end, by the superior excellence of his crop, and the consequently higher price for it in the market. For description of the process of budding, see *Appendix.*

The following note to Ellwanger & Barry's Catalogue compresses almost the whole subject of Peach Culture into a nutshell:

"1st. Keep the ground clean and mellow around the trees, and give it an occasional dressing of wood-ashes. 2d. Keep the heads low—the trunk ought not to exceed three feet in height. [One to two feet is better, we think.] 3d. Attend regularly every spring to pruning and shortening the shoots of the previous year's growth. This keeps the head round, full, and well furnished with bearing wood. Cut weak shoots back one half, and strong ones one third; but see that you leave a sufficient supply of fruit-buds. Sickly and superfluous shoots should be cut out clean."

DESCRIPTIVE LIST.

1. Bergen's Yellow.—Very large, orange, red in the sun; flesh yellow, juicy, and fine-flavored. One of the best of yellow peaches, but a poor bearer. Middle of September.—*Ellwanger and Barry's Catalogue.*

2. Coolidge's Favorite.—A most beautiful and excellent peach; skin white, delicately mottled with red; flesh pale, juicy, and rich; tree vigorous and productive. Middle to end of August.—*E. and B.*

3. Crawford's Late Melocoton. (Crawford's Superb.)—Really a superb yellow peach, very large, productive, and good. Last of September.—*E. and B.*

4. Early York.—Medium size; on young, thrifty trees, large, greenish white, covered in the sun with dull purplish red; flesh juicy, rich, and excellent; tree a fair grower and very prolific. Middle of August.—*E. and B.*

5. Large Early York.—A large and beautiful variety; white,

with a red cheek; flesh juicy and delicious; tree vigorous and productive. End of August.—*E. and B.*

6. George IV.—Large, white, with a red cheek; flesh pale, juicy, and rich; tree vigorous, and bears moderate crops of the highest quality. End of August.—*E. and B.*

7. Grosse Mignonne.—Large, dull white, with a red cheek; flesh pale, juicy, with a rich vinous flavor; a free grower and good bearer. End of August.—*E. and B.*

8. Morris White.—Medium size, dull, creamy white, tinged with red in the sun; flesh white to the stone, juicy, and delicious; tree a moderate bearer; highly prized for preserving, on account of the entire absence of red in the flesh. Middle of September.—*E. and B.*

9. Old Mixon Freestone.—Large, greenish white and red; flesh pale, juicy, and rich; tree hardy and productive; a standard orchard variety. Middle of September.—*E. and B.*

The above have been recommended by the American Pomological Society for general cultivation. The following additional varieties are given by the editor of the *Illustrated Annual Register* for 1856:

10. Early Anne.—Small, round, greenish white. Tender, slow growth—early.

11. Early Tillotson.—Medium, dark red, juicy, high-flavored. Great bearer.

12. Cole's Early Red.—Medium, red, not first quality; tree productive.

13. Early Newington Freestone.—Medium, white and red, juicy, rich, fine.

14. White Imperial.—Large, white, juicy, excellent flavor Fine at the North, often worthless South.

15. Brevoort.—Large, deep red, firm, sweet, rich.

16. Barnard.—(Yellow Alberge.)—Large, deep yellow, flavor fine; hardy and productive.

17. Jacques' Rareripe.—Very large, yellow, shaded with red; flesh deep yellow, red at the stone, good flavor.

18. Nivette.—Large, oval, yellowish green, juicy, melting, and rich.

19. President.—Large, very downy, yellowish white, with red cheek; red at the stone, juicy, fine flavor.

20. Red Cheek Melocoton.—Large, yellow, deep red cheek, juicy, good flavor.

21. Druid Hill.—Large, roundish, juicy, rich, excellent, late.

22. Old Mixon Cling.—Large, yellowish white, red cheek, juicy, rich, excellent.

23. Large White Clingstone.—Large, white, red cheek; juicy, sweet, rich, and high-flavored.

24. Old Newington.—Resembles Old Mixon.

25. Lemon Cling.—Large, deep yellow, red cheek, firm, rich, vinous, sub-acid, productive, hardy.

26. Blood Cling.—Large, downy, purplish red; flesh red, firm, good for cooking.

27. Heath Cling.—Very large, white, juicy, melting, sweet, rich, excellent.

To which are added, to make up a list of fifty of the very best, the following:

28. Yellow Rareripe.—Large, orange yellow, rich, juicy; free-stone.

29. Ward's Late Freestone.—Large, sweet, and delicious.

30. Columbia.—Large, yellow, excellent, hardy.

31. Prince's Red Rareripe.—Large, yellow, rich, productive.

32. Hyslop.—Large, melting, late, productive; cling.

33. Malta.—Large, green, delicious.

34. Late Admirable.—Large, yellow green, juicy, delicious.

35. Vanzandt's Superb.—Medium, white, red cheek, juicy, sweet, fine.

36. Walter's Early.—Large, white, red cheek, juicy, sweet, fine flavor.

Below is a partial list of sorts of later introduction, many of which have been well tested in a variety of soils, and are known to be valuable.

1. Felt's Rareripe.—Originated by Cyrus Felt, Esq., at Monte Bello, Hancock County, Illinois. Its chief characteristic is that it reproduces itself from the seed, with but little variation, and has been so grown for many years. It is a large yellow fleshed freestone, mostly covered with a deep red blush—good quality, and ripens from August 15th to 25th. Good treatment in good soil will keep this peach up to its original standard; but neglect and careless handling have caused a gradual deterioration in some orchards. It has been quite extensively propagated from the seed.

2. Stump the World.—Large, very good, white; August to September.

3. Hale's Early.—Very good, medium, red, round; juicy, soft; vigorous grower; season, last of July. In many localities this peach is subject to rot on the tree.

4. Foster.—Middle to last of August.

5. Amsden's June.—Claimed to be the earliest of all.

6. Wilder; 7. Steadley; 8. Engle's Downing; 9. Pullen's Seedling; 10. Alexander; and others of local reputation.

To these should be added the following, originated by Mr. Rivers, of England, to some extent tested in America, viz.:

Early Beatrice,	Early Victoria,	Early Louise,
Early Rivers,	Prince of Wales,	Rivers' Early York,
Stanwick Early York.		Lady Palmerston.

Training.—Peach trees should be annually shortened-in. The tendency of the sap is to the extremities and the higher branches, while the lower limbs are thus, for want of nourishment, left to die

out. Cutting back the extremities also tends to render the head more shapely and compact.

The new mode of fighting the curculio by means of the "Curculio Catcher" (described elsewhere) will necessarily have something to do with the training of the trees. But for that, low-headed trees, of one or two feet only of stem, for various reasons would be best. But this machine cannot be effectively worked under such trees. A clean stem of three to three and a half feet will be required. In view of these facts, therefore, and that these machines will be needed at sometime in the life of most of the stone-fruit trees, higher training is advised than would otherwise be desirable.

In all sections where peaches can be easily grown, it is advisable to plant largely, and only of the best varieties. The market for good peaches is never overstocked, and year by year the demand for such increases. Plant no common seedlings—and no seedlings at all, except those of known good quality, and known to reproduce themselves, or such as possess promising characteristics, for test and experiment. A tree, the product of which will bring but a half dollar per bushel in the market, occupies as much space, and requires as much labor to plant and cultivate, as one producing two and three dollar fruit. Very early and very late sorts, as a rule, will be found most profitable, either for home or distant markets.

There is a prejudice in many minds against the cling-stone varieties; but of late years that prejudice is giving way. The demand for good clings for canning purposes has of late largely increased.

SOIL.

A rich, deep, mellow loam, with a slight admixture of sand, is the very best for the growth and perfection of the peach. A light, sandy soil will produce a fine growth, and generally fair fruit; but trees in such soils are much more liable to the attacks of the peach grub than in other soils. We have seen fine, handsome young trees almost totally destroyed by them in one or two years, while trees but a short distance off, in less sandy soils, were but slightly injured.

INSECTS AND DISEASES.

The Peach-Worm—above alluded to, is the worst enemy of the peach-tree. It is the larva of a waspish-looking miller or butterfly,

which, during the summer, deposits its eggs in the bark of the tree. These soon hatch whitish-looking worms, which make their way between the bark and the wood, and, if permitted to continue their depredations, will seriously injure, and sometimes entirely destroy, the tree.

To destroy them, they must be sought out with a knife or other sharp instrument, by cutting away the outer bark, and ejecting them from their holes, which is easily done. Their presence is almost always indicated by gum, sometimes in large quantities, on the surface, at or about the hole in which the depredator may be found. Dig away the earth from about the root of the tree, a few inches below the surface; and, after scraping off the decayed bark and killing the worms, apply a bucketful of slaked lime or leached ashes, or both. Do not neglect to make a thorough search for the rascals at least once every spring, examining carefully every tree. The application of lime and ashes is a very effectual means of prevention; put it on in the spring, and allow it to remain till autumn, when it may be spread out to cover the surface for several feet, and worked in with other fertilizers.

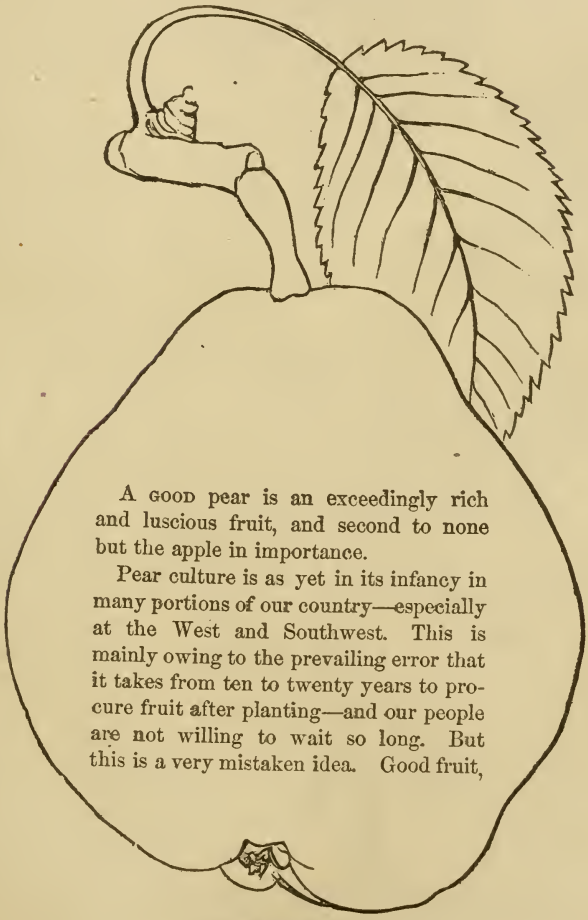
Some varieties of the peach are subject to the *mildew*. This may be destroyed by sprinkling with soap-suds, or with an intermixture of lime-water and soap-suds. Sulphur has also been applied with success.

The Yellows.—This disease in peach-trees has never yet been fully understood. It is mostly considered to have its origin in general bad management—neglected culture, exhaustion, overbearing, etc. Downing strongly recommends shortening-in as a prevention, and most pomologists concur in the opinion that long-continued good culture and care are the surest means of preventing this disease. As a remedy, cut down and utterly exterminate all trees that may be attacked; as the disease is a contagious one, and it is better to lose a few trees at the beginning than to run the risk of losing all by delay.

Leaf Curl.—The disease known as the Curl of the Leaf, by which, in the spring, the leaves will curl up, and finally fall, is occasioned by the puncture of a small insect called the plant louse. A good remedy for this is strong soap-suds, with a decoction of tobacco-juice, applied as soon as the leaves begin to curl.

Chapter Eleven.

THE PEAR.



A GOOD pear is an exceedingly rich and luscious fruit, and second to none but the apple in importance.

Pear culture is as yet in its infancy in many portions of our country—especially at the West and Southwest. This is mainly owing to the prevailing error that it takes from ten to twenty years to procure fruit after planting—and our people are not willing to wait so long. But this is a very mistaken idea. Good fruit,

Fig. 44.—THE PEAR.

Fig. 45.—Dwarf Pear.

in moderate quantities, can be obtained from the planting of the pear, as soon as from the apple, or even the peach. A gentleman at Albany, N. Y., obtained a fine crop of pears in two years from the nursery, and three from the bud, on his Bartlett, White Doyenne, and Gray Beurre trees; in one year longer his Louise Bonne de Jersey and Beurre Diel trees fruited finely; and in another, the Vicar of Winkfield. A number of varieties, not only on quince, but on pear stocks, will bear largely in four to six years. The pear requires a rich, deep, loamy soil, with plenty of lime and the

phosphates in its composition. These must be supplied by free dressings of bone-dust and slaked ashes. Whole bones from the slaughter-house will answer where the dust can not be obtained. Iron filings and sweepings from the blacksmith's shop are very good to be worked in around and about the pear-trees.

Working the pear on quince has become quite popular among nurserymen of late years. With some varieties this mode answers well, but with others does not succeed at all. THOMAS, in his *Fruit Culturist*, gives the following list of those which succeed *best* on the quince:

Louise Bonne de Jersey,	Buerre d'Amalis,	Stevens' Genesee,
Buerre Diel,	Vicar of Winkfield,	Fortune,
Duchess d'Angouleme,	Long Green of Autumn,	Glout Morceau,
Easter Buerre,	Early Rousselet,	Chaumontelle.

He also gives a list of about thirty, which usually succeed equally well on the pear and quince stock.

Cultivators should be guarded against relying too much upon this mode of culture. For orchard culture, pear stocks are generally to be preferred. Those on quince roots are not apt to be so long-lived—they require more care and skill in pruning, and they also require a far higher culture. Yet there is this advantage with them—they generally come much more early into bearing, many varieties bearing quite freely at two and three years from the nursery.

The following on that point, from one of the latest as well as the most reliable authorities, is worthy of special attention at this time:

"While a very large number of varieties will take, and grow for a year or two finely, there are comparatively few that succeed for a series of years in continued vigor and productiveness, when grown on any stock but that of the pear; and while the cultivation is now very extensive on the quince root, we can not but fear that in eight tenths it will prove unprofitable to the grower; and in the remaining two tenths require equally as much care in supplying nutrition and pruning as a system of root-pruning when grown on pear roots. * * * * Orcharding with the pear on the quince, in the manner of most orcharding in this country, will never repay the first cost of the trees; but if trees are selected of

varieties known to have been long successful, and a system of culture pursued which shall meet the requirements of the fibrous roots of the quince, then may the grower look for profit and pleasure in the result.—*Elliott.*

There can be no doubt, however, but *with proper culture and skill in pruning*, dwarfing the pear on quince may, in very many instances, be made highly remunerative.

In orchard culture, or standard trees, the pear requires nearly similar pruning to the apple—the main thing being to prevent the branches from becoming too thick.

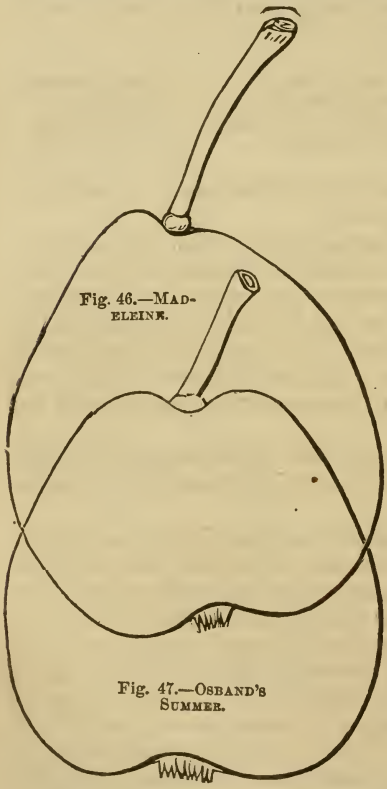


Fig. 46.—Madeleine.

Fig. 47.—Osband's Summer.

DESCRIPTIVE LIST.

CLASS I.—SUMMER.

1. Madeleine. — Medium, smooth, greenish yellow, juicy, melting. Needs house-ripening. Erect and vigorous. July.

2. Summer Doyenne—(Doyenne d'Ete.)—Small, yellow, red cheek, melting; bears very young. July.

3. Osband's Summer.—Medium, yellow, red cheek, sweet, fine flavor, vigorous grower.

4. Skinless. — Small, yellowish green, juicy, and sweet; vigorous and productive. August 1st.

5. Bloodgood.—Medium, yellow russet; melting; moderate growth. August.

6. Rostiezer.—Small, brownish green, juicy, melting, very sweet, highly perfumed flavor. Last of summer.

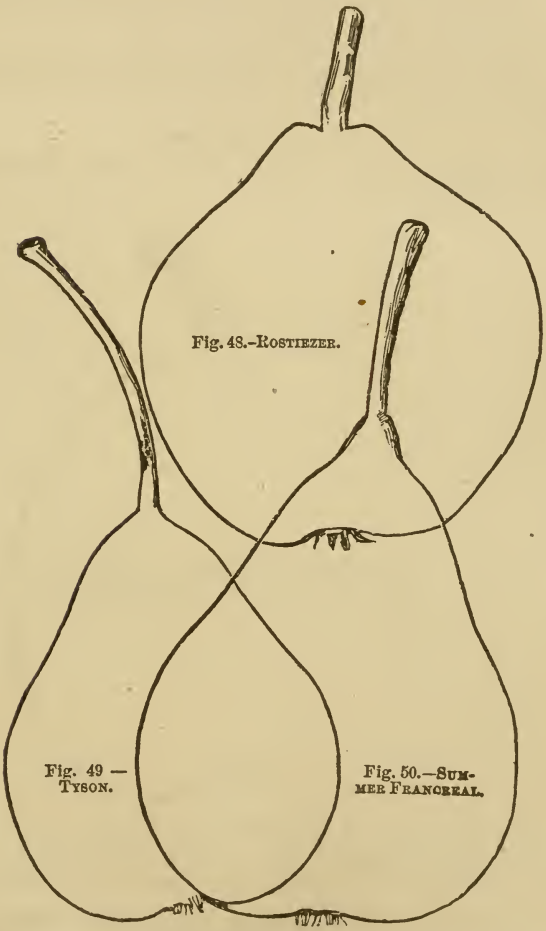


Fig. 48.–Rostiezer.

Fig. 49 — Tyson.

Fig. 50.—Summer Francreal.

7. Tyson. Medium to large, bright yellow, red cheek, buttery

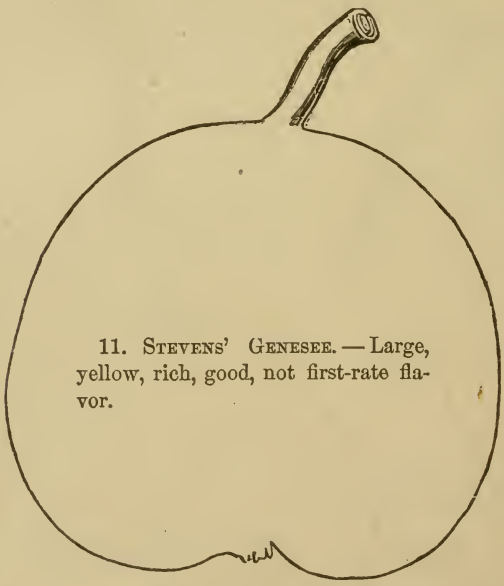
excellent. Vigorous, late in coming into bearing, but grows finely on quince, and bears soon. Last of summer.

8. Beurre Giffard.—Medium, greenish yellow, tender, juicy, sweet; highly esteemed. August.

9. Dearborn's Seedling.—Small, clear yellow, melting, juicy; fine quality. Bears young. August.

CLASS II.—AUTUMN.

10. Golden Beurre of Bilboa.—Medium, yellow, fine-grained, buttery, moderately rich.



11. Stevens' Genesee. — Large, yellow, rich, good, not first-rate flavor.

Fig. 51.—Stevens' Genesee.

12. Buffum.—Medium, yellow, reddish-brown cheek, buttery, sweet, fine flavor; growth erect, strong, healthy; very productive.

13. Andrews.—Medium, greenish brown, juicy, melting; very productive, and bears young. First of September.

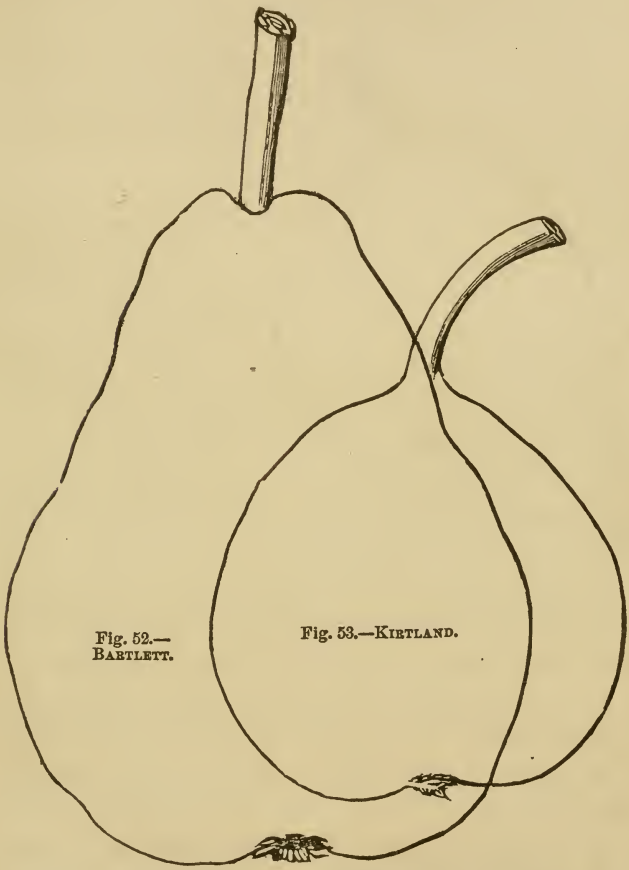


Fig. 52.—Bartlett.

Fig. 53.—Kirtland.

14. Bartlett—(Williams' Bon Chretien.)—Large, clear yellow, tender, buttery, sweet; erect and thrifty—bears very young. First of autumn.

15. Kirtland.—Medium, greenish russet, buttery, melting, high-flavored.

16. Seckel.—Small, brownish green, becoming rich, yellowish brown; sweet, melting, buttery, highly perfumed; the richest and highest flavored pear known. Growth slow, small, very productive.

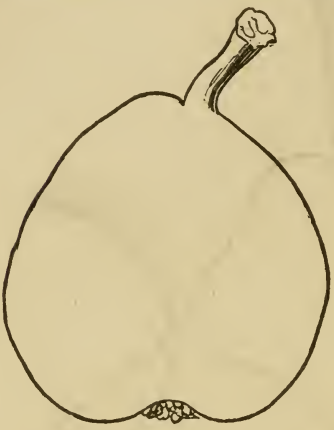


Fig. 54.—Seckel.

17. Flemish Beauty.—Large, reddish brown russet, melting, juicy, sweet, rich, excellent, strong, healthy, productive.

18. Howell.—Large, pale yellow, melting, buttery; bears very young; always productive.

19. Buerre d'Anjou.—Large, greenish yellow, buttery, melting, rich, vinous, excellent. Fine, even bearer. Valuable.

20. Duchess d'Angouleme.—Very large, greenish yellow, rather coarse, melting, buttery, juicy. Vigorous—always best on quince.

21. Gray Doyenne.—Resembling the above, but smaller.

22. Fulton.—Small, dark cinnamon, buttery, rich, sprightly, agreeable. Hardy and productive. Valuable.

23. Sheldon.—Large, greenish yellow, russet, juicy, rich, excellent.

24. Napoleon.—Large, green, yellowish, very juicy, melting. Very productive, thrifty, hardy.

25. Beurre Bosc.—Large, deep yellow, juicy, buttery, rich, excellent. A regular, even bearer.

26. Autumn Paradise.—Large, yellow orange, melting, buttery, rich, excellent flavor.

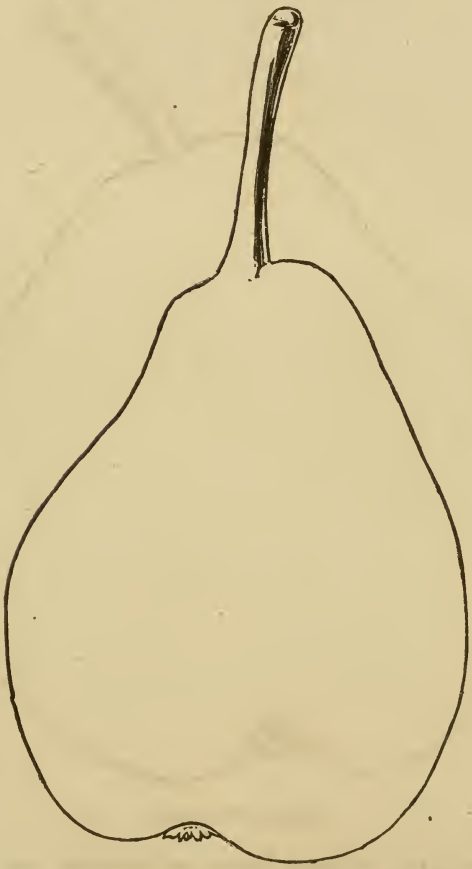


Fig. 55.—Louise Bonne de Jersey.

27. Louise Bonne de Jersey.—Large, yellowish green, brown-red cheek, buttery, melting, rich, very productive; grows finely on quince.

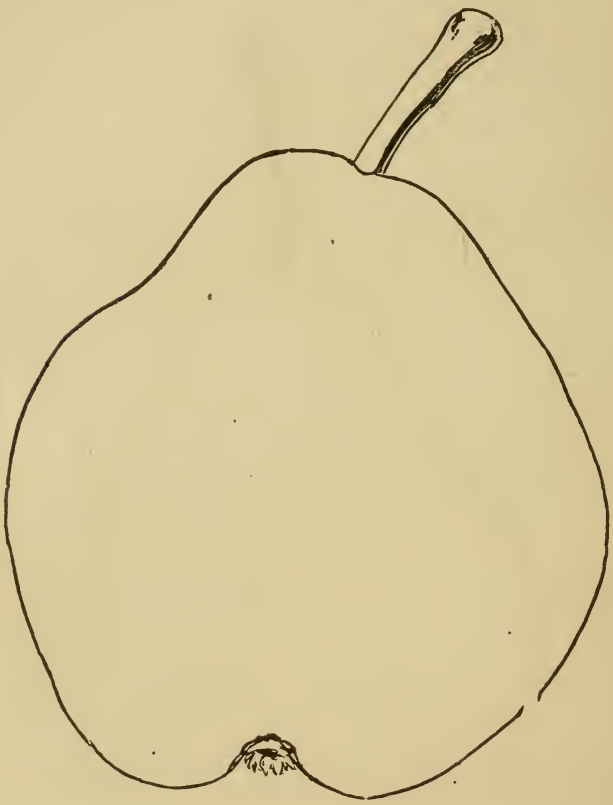


Fig. 56.—Onondaga.

28. Onondaga.—(Swan's Orange.)—Quite large, rich, yellow, slightly buttery, melting; flavor good, not first-rate. Strong grower, early bearer. Valuable.

29. Beurre Diel.—Large, dull yellow, rich, sugary, buttery, juicy, fine. Best on quince.

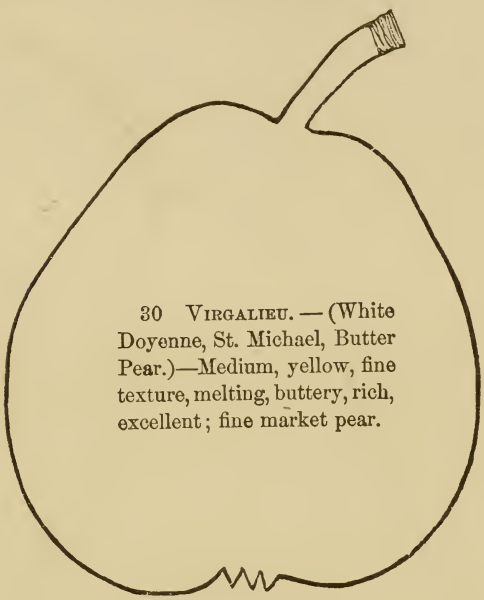

30 Virgalieu. — (White Doyenne, St. Michael, Butter Pear.)—Medium, yellow, fine texture, melting, buttery, rich, excellent; fine market pear.

Fig. 57.—Virgalieu.

CLASS III.—WINTER.

31. Beurre d'Aremberg.—Large, greenish yellow, melting, juicy, vinous; great bearer, good keeper. Early winter.

32. Lawrence.—Medium, yellow, melting, sweet, rich. Good grower, fine bearer. Early winter.

33. Passe Colmar.—Medium, pale yellow, buttery, melting, sweet. Overbears. Early winter.

34. Doyenne d'Hiver.—Large, yellow and brown, melting, buttery, rich. Vigorous; long keeper.

35. Prince's St. Germain.—Medium, green and dull red; juicy, melting, fine. Ripens through winter.

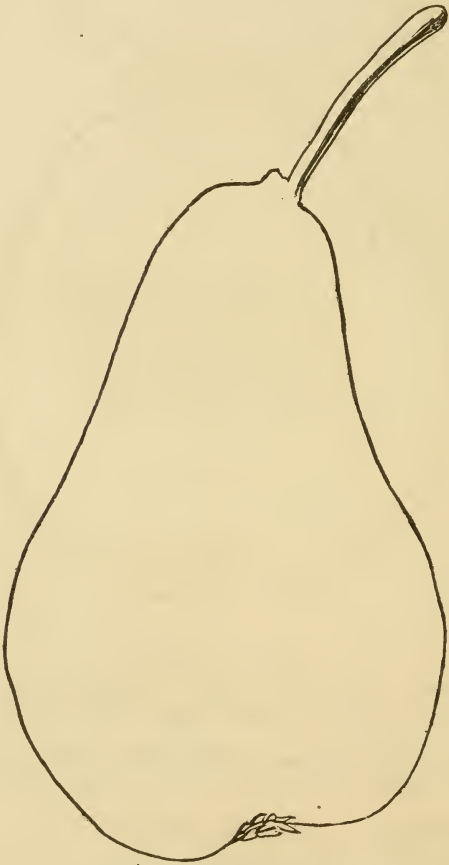


Fig. 58.—Vicar of Winkfield.

36. Vicar of Winkfield.—Quite large, pale yellow, reddish cheek, juicy, buttery, good. Ripens late autumn and early winter for about three months, which, with its productiveness, fine qualities for cooking, and uniformly fair fruit, makes it very valuable.

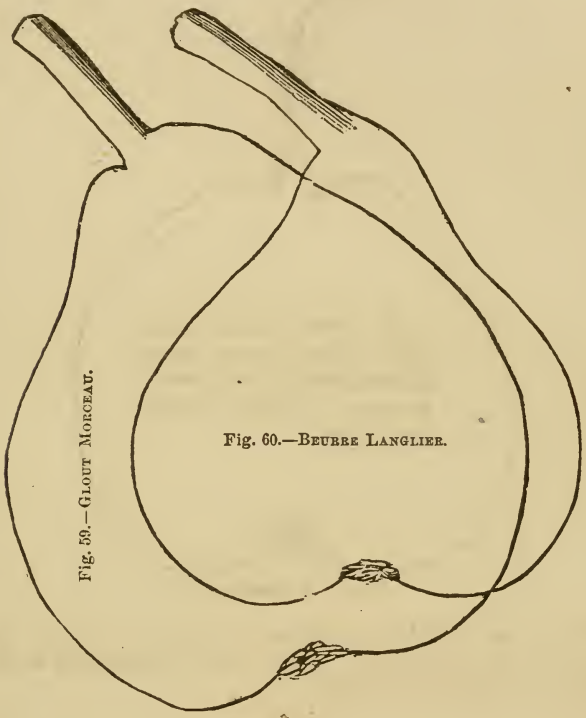


Fig. 59.—Glout Morceau.

Fig. 60.—Beurre Langlier.

37. Glout Morceau.—Large, greenish, buttery, melting, sweet. Early winter. Best on quince.

38. Beurre Langlier.—Large, pale yellow, slight blush, melting, juicy, rich. Early winter.

39. Easter Beurre.—Large, yellowish green, very buttery, excellent, juicy, first-rate flavor. Ripens in spring. Best on quince.

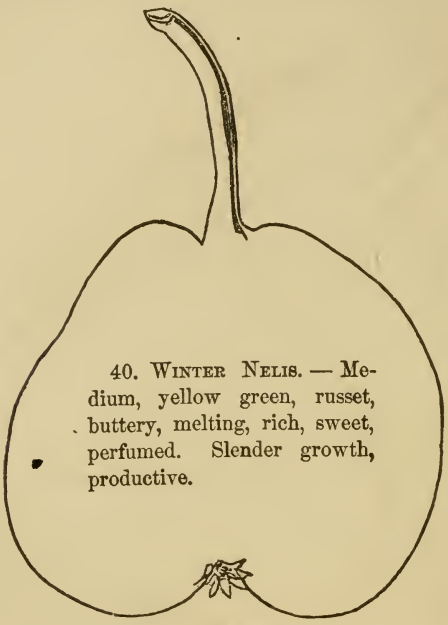


Fig. 61.—Winter Nelis.

The above list (with descriptions condensed) is extracted from Tucker's *Annual Register*. The following are described in Ellwanger & Barry's *Catalogue:*

SUMMER.

41. Amire Joannet.—On pear and quince, profuse bearer.

42. Beaupresent d'Artois.—Productive on quince.

43. Canandaigua.—Good on pear or quince.

44. English Jangonelle.—Good on quince.

45. Kingsessing.—On pear or quince.

46. Striped Madeleine.—Similar to No. 1, only striped.

47. Muscadine.—Not good on quince.

48. Moyamensing.—Good on both pear and quince.

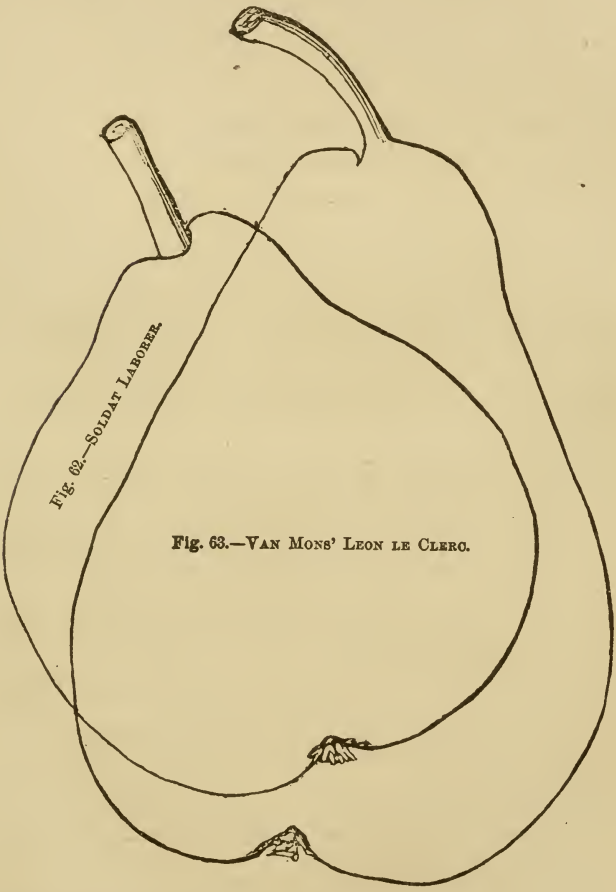


Fig. 62.—Soldat Laboree.

Fig. 63.—Van Mons' Leon le Clerc.

49. Rousselet Stuttgart.—Good on both.

50. Summer Franc Real.—Ditto.

AUTUMN.

51. Beurre Capiaumont.—Good on quince.

52. Beurre Superfin.—Bears young. Good on quince.

53. Beurre d'Waterloo.—New—good on quince.

54. Bonne d'Ezees.—Delicate on quince.

55. Gansel's Bergamot.—Best on pear.

56. Bezi de Montigny.—Fine on quince.

57. Compte de Larny.—Bears well on quince.

58. Dunmore.—Large, fine, very productive.

Add the following as new pears which promise well:

Soldat Laborer,	Beurre Goubault,	Beurre Clairgeau,
Van Mons' Leon le Clerc,	Manning's Elizabeth,	Doyenne Goubault,
Ott,	Julienne,	Van Assche,
Westcott,	Duchess of Berry,	Bergamotte d'Esperin,
Sterling,	Jalousie Fontenay Vendee,	Josephine de Malines.
Beurre Giffard,		

Among the newer sorts that have attracted considerable attention of late years, the following only are named:

Clapp's Favorite.—A large, handsome pear of good quality, resembling the Flemish Beauty, and supposed to be a cross between it and the Bartlett. Ripens a little later than the latter.

Dana's Hovey.—Small, late, a long keeper; very good.

Edmunds.—Large, excellent, ripening late in September. Tree a vigorous and rapid grower.

Dix.—An excellent variety, but slow grower, and long in coming into bearing.

Howell.—Hardy, good bearer; fruit large and handsome.

Lawrence.—Hardy, a moderate grower, but not an early bearer. Late, and a long keeper.

But in the lists to be found in the nursery catalogues, there are few, if any, more reliable and better suited to the wants of most planters, than the old well-known sorts, such as Bartlett, Belle Lucrative. Beurre d' Anjou, Doyenne White, Duchesse d' Angouleme, Flemish Beauty, Louise Bonne de Jersey, Seckel, Tyson, Urbaniste, Vicar of Winkfield, etc.

Chapter Twelve.

THE PLUM.

The plum is a native of this country, and is to be found in great variety, growing wild in many parts of the United States. It is naturally a prolific bearer, producing most generous crops of red and golden fruit, and has been as much improved by scientific propagation and culture as any other fruit. It can be cultivated with much success in a great variety of soils and climates, but of late years has been much neglected, in consequence of the ravages of the curculio—that arch destroyer of all the smooth-skinned fruits. In many instances cultivators have cut down their trees, and given it up in despair, while thousands of others, when planting, have neglected to plant the plum altogether, and devoted their grounds to other fruits. This is wrong; for if only partial crops can be occasionally secured, it will repay the labor and expense, and then many experimenters have an abiding faith that the ravages of this great enemy will yet be arrested.

Let every owner of an orchard or garden, however small, plant at least a few of the best sorts, and our opinion is, that an enlightened and liberal culture, with a vigilant lookout for the first appearance of the enemy, will produce its reward in time.

Plums are generally thought to do best in strong, clayey soils—but they thrive in a great variety of soils. Plant in any good soil; but wherever that may be, be sure that it is well drained, and that the tree is liberally supplied with its necessary and proper food.

Animal manures and salt are regarded as the best for that purpose. These should be applied early in the spring, in the Middle States. Sow a half peck or so of salt under each tree, covering the ground to such a distance as the roots extend.

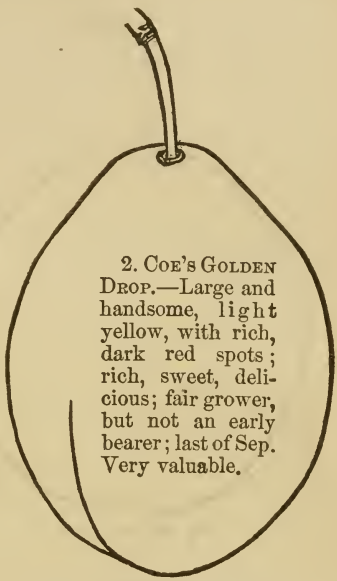
Fig. 64.—The Plum.

VARIETIES.

The American Pomological Society recommends the following as being worthy of general cultivation:

1. BLEECKER'S GAGE.—Medium size, roundish oval, yellow, rich, and luscious. Tree a fair grower, and productive. Last of August.

Fig. 65.—BLEECKER'S GAGE.



2. COE'S GOLDEN DROP.—Large and handsome, light yellow, with rich, dark red spots; rich, sweet, delicious; fair grower, but not an early bearer; last of Sep. Very valuable.

Fig. 66.—COE'S GOLDEN DROP.

3. GREEN GAGE.—Rather small, round; green, then yellow; melting, sweet, and rich. Slow grower.

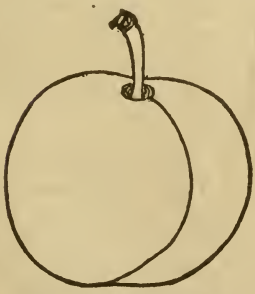
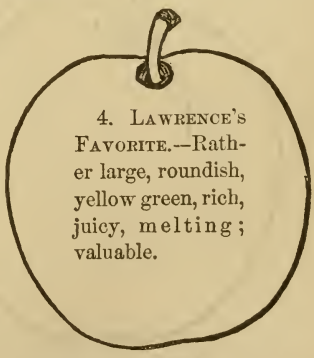


Fig. 67.—GREEN GAGE.



4. LAWRENCE'S FAVORITE.—Rather large, roundish, yellow green, rich, juicy, melting; valuable.

Fig. 68.—LAWRENCE'S FAVORITE.

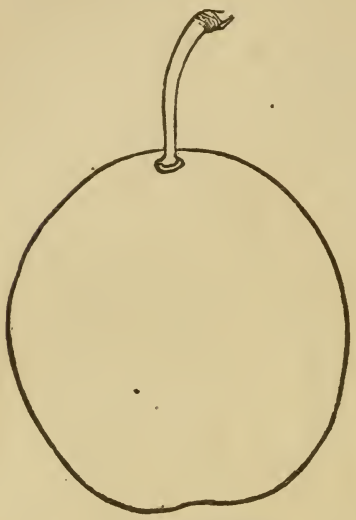


Fig. 69.—Jefferson.

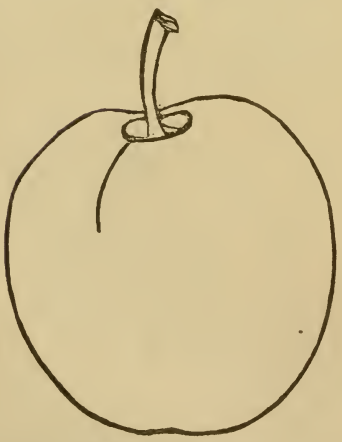


Fig. 70.—Washington.

5. Frost Gage.—Small, deep purple, subacid, then sweet, very late, hardy; great bearer.

6. Jefferson.—Large, oval, golden, purplish cheek, juicy, rich, high-flavored. Slow grower, but prolific. Last of August.

7. McLaughlin. — A new plum from Maine. Large, flat, russet yellow, red tinge, juicy, firm, very sweet; remarkably hardy, vigorous, and productive. Last of August.

8. Purple Gage.—Medium, roundish, violet; firm, rich, sugary, excellent. Tree similar to Green Gage.

9. Purple Favorite.—Medium, roundish, brown purple, very juicy, tender, melting, sweet. Slow grower, but hardy and productive. Middle of August.

10. Washington.—Very large, green with red; firm, sweet, mild. Free grower and bearer. Last of August. Good in a variety of soils.

11. Reine Claude de Bavay.—Foreign, new, one of the best; very large, roundish, green with red; firm, juicy, sugary, rich. Vigorous and very productive. Middle of September.

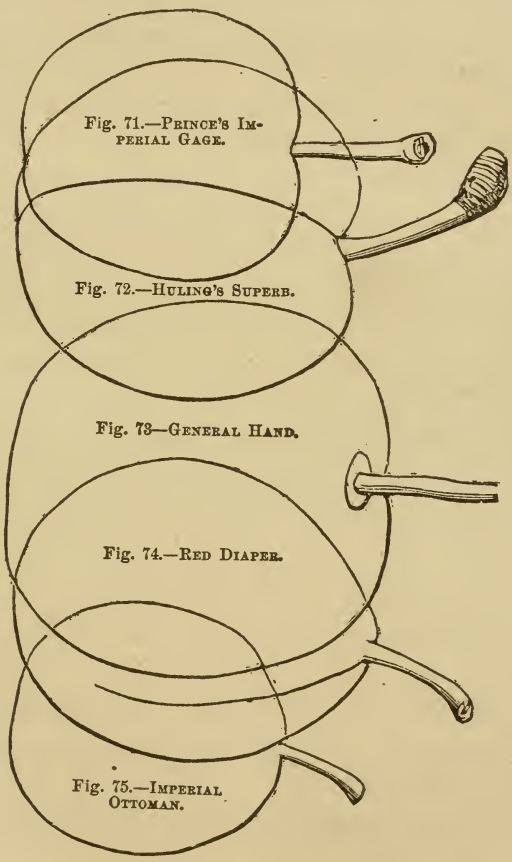


Fig. 71.—Prince's Imperial Gage.

Fig. 72.—Huling's Superb.

Fig. 73—General Hand.

Fig. 74.—Red Diaper.

Fig. 75.—Imperial Ottoman.

12. Smith's Orleans.—Very large, reddish purple; juicy, vinous flavor. Productive, vigorous. Last of August.

To which may be added the following, all of which have been recommended as valuable in certain soils and localities:

13. Denniston's Superb.—Medium, very productive. Middle of August.

14. Prince's Imperial Gage.—Hardy, productive; superior to Green Gage.

15. Lombard.—(Bleecker's Scarlet.)—Thrifty, hardy, productive. Not so attractive to the curculio as others.

16. Madison.—Good flavor, very late, hardy. Last of October.

17. Imperial Ottoman.—Early, hardy, abundant bearer. Last of July.

18. Prince's Yellow Gage.—An abundant bearer and good for market.

19. Red Gage.—Small, good flavor; hardy and vigorous, and an abundant bearer.

20. Saint Martin's.—Good bearer, late. First of October.

21. Schenectady.—Thrifty, hardy, prolific. Last of August.

22. Autumn Gage.—Slow grower, but productive; medium, yellow.

23. Coe's Late Red.—Medium, purplish red; very productive.

24. Downton Imperatrice.—Medium, pale yellow. Last of September.

25. Fellenberg. Very productive, late; good for drying.

26. General Hand.—Very large, yellow; vigorous and productive. First of September.

27. Ickworth Imperatrice.—Large, purple. October. Will keep till Christmas.

28. Manning's Long Blue Prune.—Large, oval, purple; bears abundantly. September.

29. Prune d'Agen.—New, French, excellent. Last of September. Great bearer.

30. Reine Claude d'October.—Small, green, rich; very hardy. Middle of October.

31. Rivers' Early Prolific.—New, English; medium, excellent; very productive, early.

32. Royal Hative.—Medium, purple, new. August.

33. Primordian.—Small, very productive. First of July.

34. Howell's Early.—Small, sweet, productive.

35. Peach Plum.—Very large and productive; dull red.

36. Hudson Gage.—Medium, yellow, rich, excellent.

37. Duane's Purple.—Very large, showy, and productive.

38. Bingham.—Large, deep yellow; productive, valuable.

39. Huling's Superb.—Large, oval, excellent; moderate bearer.

40. Blue Plum.—From the South. Productive. Propagated by suckers.

41. Buel's Favorite.—Large. Last of August.

42. Columbia.—Large, valuable for the South. Last of August.

43. Emerald Drop.—Medium, productive. Last of August.

44. Early Purple.—Small, round; good at the South. June and July.

45. Elfrey.—Very productive, good for drying; succeeds best South. July and August.

46. Italian Damask.—Productive, fine South; good in all soils.

47. Long Scarlet.—Medium, red and yellow. Last of August. Fine for jelly.

48. Thomas.—Large and good; great bearer. September.

49. Red Magnum Bonum.—Large, beautiful; vigorous and productive.

50. Yellow Magnum Bonum.—Large, good for cooking; very productive; profitable.

Of late years, the great search of the orchardists is to find a plum that is curculio-proof. The fear is, that if such a variety exists, and should be discovered, it will be found to be *man-proof* as well, and worthless as a fruit. The claim has been made, however, in behalf of several new introductions—chief of which are the following:

Miner.—(Named by the Illinois State Horticultural Society, *Hinckley*). A plum having its origin among the Chickasaw wild plums of the Northwest. Many seedlings have been sent out under the name of Miner, some of which are worthy of cultivation, while others are of no account. The true Miner is not proof against the curculio, but it is said the eggs do not hatch in it, and consequently the fruit is little injured.

Wild Goose.—This is another claimant from the Chickasaw family, which originated in Tennessee.

Of this there are also many spurious sorts in the market, but the true Wild Goose is a fine, large plum, and an exceedingly hardy and prolific variety. Like the Miner, it is not curculio-proof, yet it is but slightly affected by it.

No planter should purchase either the Miner or Wild Goose until he is absolutely certain that it is true to name.

Chapter Thirteen.

THE RASPBERRY.

Of late years the raspberry has received much more attention than formerly. That it is one of the best, most wholesome, and most admired of the small fruits is generally conceded. With a good knowledge of its character as a plant, and its habits of growth, the raspberry can be as easily obtained as any other fruit, and with reasonable care will most generously repay the labor bestowed upon it.

Like the blackberry, the raspberry bears its fruit upon the canes of the second year's growth—which, after the fruiting, die; and during this process of fruiting new canes are coming forward for the succeeding year. To this rule there are some exceptions, in those varieties known as *everbearing*, as the Ohio, Lum's, Catawissa, etc. This class bears fruit both on the first and second year's growth, the first year's crop being produced late in the season, often lasting until frost.

There are many varieties of the raspberry quite distinct in character, but all may be placed in two classes: First, those propagated from tips of the new growth; and second, those produced by suckering from the roots. To the first belong nearly all the black varieties, while the red generally belong to the latter class. Many of the red are more tender, and for this reason are not so popular with inexperienced growers. The red are also objected to because of their suckering so badly, as many of them do. In the West the black sorts are chiefly grown, being considered more able to withstand the changeable and rigorous winters, and the scorching heat of summer in that climate. In the East the reds are more popular, and in some localities seem much more at home than in others. The fruit of the red will generally command a higher price in the markets of the large cities.

PROPAGATION.

To obtain plants of the black-cap sorts, the tips of the new canes (which are already bending over and seeking the ground) should be slightly covered in mellow soil in the fall—say in September—when each shoot or branch will become rooted and form an independent plant. These may remain all winter undetached from the parent stem, and in the spring taken up and transplanted for permanent growth. The other sorts, when plants are wanted, may be allowed to sucker freely, and transplanted either in the fall or spring. All but a few inches of the stem should be cut away in transplanting.

If the plantation is fully established, and no more plants needed, it is best to cut away early in the spring all the canes not desired for fruiting of the suckering sorts, treating them as weeds. Many fail of securing good crops of fruit from being too lenient towards these suckers. Four to six canes in a hill, with the hills two feet apart in the rows, are quite sufficient; all else should be rigidly kept down. Of the tip varieties the growing canes should be pinched off in the summer, the first season after planting, at 18 inches high; and in after seasons at two and a half to three feet. This causes them to throw out side-shoots, which, in turn, should also be pinched back once or twice during the season. It is seldom they get pinched too often. By this process the cane is greatly strengthened, and it will form large bushy heads for next year's fruitage, and the crop thereby largely increased. The suckering sorts should also be pinched for the same purpose.

SOIL, ETC.

Any soil that will grow a good crop of corn will answer for raspberries; but the best is a naturally loose, rich loam, with a slight admixture of sand. Stiff clay soil should be previously well worked and plentifully supplied with barn-yard manure. Lime, muck, and particularly ashes, are all good fertilizers for raspberries.

PLANTING AND DISTANCES.

Many plant in rows five to six feet apart, and three feet in the row. In this way near 2,000 plants are required to the acre. But as good culture is desirable, a better way, perhaps, is to plant in hills four feet apart each way, so that cultivators can be run both

MAMMOTH CLUSTER.

ways between them. This greatly lessens the labor of dressing with the hoe.

If a rigid system of pinching-back has been practiced, no stakes will be needed. Yet it can not be questioned that stakes and careful tying up will add much to the neat appearance of a raspberry plantation—and they will add greatly to the expense, too, especially in many localities where wood is scarce. In garden culture where only a few dozen plants are grown, staking had best be practiced; in which case a taller growth may be permitted.

The chief need for stakes is in the protection of the growing canes, which are sometimes broken off by hard winds; but usually the old fruit-stalk affords that protection till the season has advanced, and the young wood has become ripened and capable of sustaining itself. Some cultivators cut out the old wood as soon as the fruit is off, and for garden culture this should be done. But in the field they may be allowed to remain longer, in order to give support to the unripe young canes.

VARIETIES.

Of the tip varieties, among the old sorts, we shall name only the following :

1. Doolittle.—(American Improved Black Cap.) This is among the hardiest of the raspberry family. The plant is a vigorous and strong grower, and when well pruned and manured, in good soil, is highly productive, yielding a crop of moderate-sized fruit of fair quality.

2. Miami.—Also a black cap, somewhat larger than the Doolittle, but not so prolific, nor quite so hardy.

3. Mammoth Cluster.—Sent out by Mr. Purdy, of Western New York. Larger and better than either of the above, and about ten days later than the Doolittle. It is an abundant bearer and a strong grower.

4. McCormick.—A berry similar to the Cluster, and by many thought to be identical. Some good judges, however, pronounce them different. If different, the two have been disseminated so frequently as identical that it is now hard to distinguish them.

5. Seneca.—Also a black-cap of the same family as the above.

DAVIDSON'S THORNLESS.

6. DAVIDSON'S THORNLESS.—A good variety with stems almost devoid of thorns, but with very fine spines on the under side of the leaves. This is a good grower, quite hardy, and, excepting that it is not as prolific as other black-caps, would be a valuable sort. It is very generally deemed a moderate bearer. In localities where it can be made to yield well it should always find a place.

7. OHIO EVERBEARING.—Another good black-cap, large, and of fair quality. It produces a moderate crop on second year's growth, and afterwards a moderate yield in September from the tips of new growth. Both crops, however, seldom equal the one crop of the Doolittle or Mammoth Cluster.

8. LUM'S EVERBEARING.—Of similar habits with the Ohio; said to be a better berry. Not yet extensively known.

9. CATAWISSA.—A dark red or purple berry of good quality on everbearing canes. Not so prolific and not so well known as the Ohio, and not regarded as of special value.

10. PURPLE CANE.—A rampant grower, not so prolific as the blacks; producing moderate crops of a soft, bright, red berry of fine quality, but unfit for market. Its canes are of a purple hue.

Of those propagated by suckers we have—

11. THE OLD RED ANTWERP.—Which has been propagated for scores of years, and is the presumed progenitor of many of the later red sorts on the one side. It has given place in a great degree to—

12. HUDSON RIVER ANTWERP.—A sort which has been long the great market berry along the Hudson river and other localities east. It is a large, long bearing variety, early, and of a musky flavor. It has declined of late years, and is giving place to newer sorts.

13. FRANCONIA.—A large and good-flavored berry, also of foreign origin, and like most of them rather tender without winter protection.

14. HORNET.—A fine large berry, not widely known, and of uncertain character. In favorable situations it is much esteemed.

15. CLARKE.—A soft, rich, large and beautiful crimson berry, highly praised in some quarters, but often condemned. It is among the hardiest of the red sorts, but in northern localities needs winter protection.

16. PHILADELPHIA.—Another quite hardy sort that needs but little protection in winter. It is large and of good quality, and very popular in some localities. There are evidently two sorts dis-

BRANDYWINE.

seminated under this name: one as above described, the other not worthy of cultivation. This fact may account for the wide differ-

ence in the reports concerning it. The spurious sort is small or medium in size, roundish, soft, with large seeds, and falls to pieces in picking. There are many of the spurious sorts all over the country, and great care should be observed in the selection of plants.

17. FASTOLF.—A foreign sort of good quality, but tender and too soft to be profitable.

Of *newer sorts* of the black-cap family are—

18. ONTARIO.—Promising, but not much known.

19. FAY'S THORNLESS.—Similar to Davidson. Said to excel it.

20. NORWOOD.—Not much known.

21. EARLY CLUSTER.—Ditto.

Of the *newer varieties* of red are—

22. HERSTINE.—A productive and strong grower, with large and beautiful fruit of good quality, but soft and unsuited for market.

23. ELLISDALE.—A seedling of the Purple Cane, which it resembles.

24. FRENCH.—Of the Red Antwerp class. Very productive, vigorous grower.

25. ALLEN'S HYBRID.—Generally discarded.

26. TURNER.—Originated by Prof. Turner, of Illinois. Prolific and hardy. Berry of good size and quality. Is quite popular at the West.

27. BRANDYWINE.—(Susqueco.) A Delaware variety of growing reputation. A. Hance & Son, of Red Bank, N. J., claim that it is "iron-clad"—withstanding equally well the severe cold of winter and the long droughts of summer.

28. HIGHLAND HARDY.—Robust habit, strong canes, hardy. Fruit only medium in size, bright red, and ripens ten days earlier than the Hudson River Antwerp—which it is said to be superseding.

29. ST. LOUIS.—A promising sort at St. Louis, Mo.

30. GANARGUA.—Said to be a hybrid between the red and black, and carries the characteristics of both. Is a rank grower, hardy,

early and productive. Berry large, fine flavored, firm, and neither red nor black. Propagated from the tips.

HIGHLAND HARDY.

In addition to the above are several varieties of yellow raspberries, of which the *Brinckle's Orange* is probably the most known and best. But it is tender and can not be had except by most careful winter protection. It is of beautiful orange color, and excellent quality.

Col. Wilder is another of the same class, about as large, but not quite equal to the Brinckle.

Golden Thornless is a new candidate for public favor of the yellow sort, for which great merit is claimed. Not widely known.

The above-named will furnish the planter with a list from which a selection can be made for any section of the country. New beginners had best, however, confine their choice to two or three of the hardiest and best known sorts.

Chapter Fourteen.

THE STRAWBERRY.

While many people produce annually large crops of strawberries without difficulty, it is nevertheless true that a majority make lamentable failures. There are various reasons for this difference, chief among which are these three: 1. A want of knowledge; 2. Carelessness and neglect; and, 3. Unfavorable location or unproductive varieties.

To be successful as a strawberry grower, one must have a sufficient love and taste for the business to induce him to take an interest in it, and qualify himself for its requirements. It is often said by writers on the subject, that strawberries can be as easily grown as corn or potatoes. That is so—if one knows how. But it is *not* as easy to *know how*, to prepare the ground, and to select and plant, and cultivate, and gather, and market strawberries as it is corn or potatoes. The veriest clod-hopper can go to the field and plow, and prepare and plant corn, and cultivate and harvest a fair crop—even an extraordinary one. But it requires a nicer discrimination, and a closer knowledge of cause and effect, to properly conduct a strawberry plantation.

To succeed well one must first acquire some knowledge of the character and habits of the plant. A full acquaintance with the science of botany and the physiology of plants is not requisite; but one should understand somewhat the differences of growth and their sexual characteristics to enable him to choose properly.

YIELD PER ACRE.

We have asked the question frequently of the uninitiated, Which will yield the most bushels per acre, corn or strawberries? The answer has frequently been that corn will yield the most: and men have been astonished at the assertion that strawberries can be made to excel it three-fold. On the subject of yield, we quote from relia-

ble authorities. Mr. Pardee, a celebrated grower of New York, stated some years ago, that he has grown on small beds at the rate of 250 bushels per acre. Mr. Fuller, of New York, high authority everywhere, mentions 300 bushels per acre. Parry, of Cinnaminson, New Jersey, says he has grown 210, but thinks one-third of that a fair crop. One hundred and fifty have frequently been obtained. The writer of this has known 80 and 120 bushels per acre on fields where the owners admitted that proper treatment would have increased the yield fifty per cent. And in one instance, he measured the ground occupied by a small patch of Wilson's Albany, in which the yield was at the rate of more than 300 bushels per acre.

Yet these stories of large crops are apt to be deceptive, and mislead the new beginner into expecting more than he can realize. Very much depends on soil and location, or rather, the adaptation of the sort to the soil chosen for the plantation. Much more depends upon the manner of planting and the care and management they receive. With any good bearing variety, of good size fruit, planted on well prepared and suitable soil, and properly managed, it is not at all extravagant to claim that 100 bushels can as readily be obtained as that of 50 bushels of corn can be taken from the same ground.

SOIL AND LOCATION.

The strawberry varies greatly in its adaptation to soils; and herein lies one of the chief difficulties in its culture. Some varieties do well on almost any soil and location; while others are far less easily satisfied; some sorts will not grow at all, and yield a crop, unless in a soil to which they are adapted. Most of the best known and popular sorts will succeed reasonably well on any soil that is suitable for a crop of corn or potatoes. The main thing is to have the ground mellow and well drained. Clay soils, liable to bake, should be enriched by a liberal supply of barn-yard manure, and should be deeply subsoiled. This should be done in the fall. Land that is free from weeds and grass should be selected, if possible.

PLANTING.

Strawberries are propagated from runners; each plant throwing out a number during the season of growth, which, taking root at the joints, form new plants. These new plants should always be chosen, whether the planting be done in the fall or the following spring. Old plants should never be taken.

Fall planting is not to be recommended, except in the South. North of 38 degrees, spring planting will be found preferable. Some advise fall planting, in order to get a partial crop of fruit the next season. This is a poor policy, however; as the crop is a delusion, and will not compensate for the injury done to the plant by the winter. The plant needs one season to establish itself, and then rest before beginning its work of fruit-bearing. The ground should, however, be thoroughly prepared in the fall, so that the spring work may be done early, and before the plants are too much grown.

The first question to decide after the preparation of the ground in the spring is, which mode to adopt. There are three modes of strawberry culture practiced with more or less success. The first is the *bed* system, or that in which the plants are expected and allowed to cover the whole ground. This a slovenly and careless way, but is often practiced in gardens and small lots. The one bed is allowed to continue till the plants become so thick that they will no longer yield fruit worth picking, when it is given up and a new one planted. Another is the *row* system, in which the runners are confined to the row, of say a foot wide, while the intermediate spaces are kept clean by cultivation. This is the system most followed in field culture, and if properly done, will bring greater yields than any other. The third is the *hill* system. In this, the runners are kept carefully cut, and not permitted to set new plants, and the whole work of fruiting is confined to the original plants. For some varieties this mode is well suited; and if size of fruit rather than quantity is the object, is very successful.

For field culture the row system is preferable, as it certainly is most desirable for all ordinary planters. For but few cultivators can be found who, after adopting the hill system, will persevere in keeping the runners cut through the season, so as to produce the best results. The distance between rows should be three or three and a half feet, and the plants may be set twelve to eighteen inches apart in the row. Such sorts as throw out many runners and multiply fast, may be set the greater distance; others less vigorous may be set closer. These distances will permit of clean culture by means of plow and cultivator, which should be freely used during the season after planting. Weeds and grass should be kept out of the row also, by pulling or with the hoe.

If plants are thus set in the spring, and well managed, by fall the

row will be well filled with new and vigorous plants, suited to bear a good crop of fruit the next season.

At the approach of winter, and just before the ground freezes, the rows should be carefully covered with some suitable mulch, to protect the plants from the rigor of winter. Old, rotten straw, or hay, or weeds, or leaves of trees—or any light material not containing seeds—will answer for this purpose; but care should be taken not to put it on heavy enough to smother the plants. The best material that can be named, perhaps, is a mixture of straw and leaves.

In the spring, as soon as the ground will do to work, the earth between the rows should be thoroughly loosened and pulverized as close to the plants as possible, with a plow or cultivator. Then the mulch should be renewed and worked well down among the plants, and left till after the picking is over. All weeds and grass should be pulled out as they make their appearance.

This mulching in the spring is highly essential for a variety of reasons. It serves to keep the weeds from growing; it keeps the ground moist in dry weather; it protects the fruit from the soil; and it renders picking more pleasant and cleanly.

With some varieties, these rows will continue to give good results for several years, treated as above described. But as a rule, two good crops are as many as can be obtained. It is best, perhaps, to have a new plantation made every year, so that one can be discontinued annually, after running three years and fruiting two.

VARIETIES.

We come now to the most difficult part of the whole business of strawberry culture, the choice of varieties. There are so many kinds of soil, and so many varieties to select from—all having points of excellence, perhaps, under certain conditions—that the question of *what to plant*, so as to insure the best results, is extremely difficult to decide. Here, again, the advice given in regard to the planting of the tree fruits is applicable. Let each beginner compare his soil and surroundings with those of his neighbors, and observe what sorts are doing best in similar situations. And let him, after acquiring a knowledge of his soil, learn from the books what varieties are best adapted thereto. In this way much can be gained. Yet much will still have to be found out by actual experiment.

The first consideration in the selection of plants, is *productiveness*.

The second is, or should be, *quality*. The third, *size*. A very productive sort, if of small size or poor quality, is not desirable. So, a variety that will produce berries of enormous size, and but few of them, is not a profitable one to plant. In the list which follows will be named only a comparative few of the varieties known to cultivators, but from which, with the best light now before us, a selection can be made adapted to all parts of the country, and a great variety of soils and conditions, and of size, quality, and yield, to suit the most exacting and sanguine.

LIST OF VARIETIES.

1. AGRICULTURIST.—Strong and hardy plant, with large, dark foliage; berry large, irregular, conical, coxcombed; crimson, rather soft. Does best in sandy and light soils.

2. AUSTIN.—Hardy, vigorous, a moderate bearer; large, round, bright scarlet, insipid. Early.

3. BLACK DEFIANCE.—Moderately prolific; very large, dark, high-flavored.

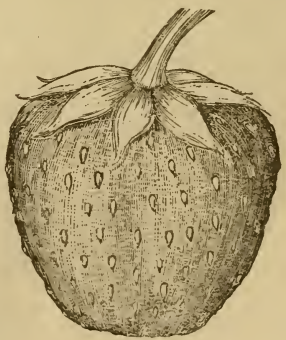
4. BOYDEN'S NO. 30.—(Seth Boyden.) Hardy, strong; prolific; very large; excellent. Originated in the sandy soil of New Jersey.

5. BROOKLYN SCARLET.—One of the *Tribune* prize berries; large, variable, uncertain.

6. BUFFALO SEEDLING.—Said to be identical with McAvoy's Superior.

7. CHAMPION. — New; vigorous and productive; large, promising, not widely disseminated. A pistillate, and must be fertilized with perfect sorts.

8. CHARLES DOWNING.—Vigorous, hardy, productive; berry large, handsome, but rather soft for market. It is being widely known, and does well in many localities; very promising.



DUNCAN.

9. COL. CHENEY.—New; another very promising sort; very large.

COL. CHENEY.

handsome; prolific, but needs fertilizing, as its flowers are not all perfect.

10. DOWNER'S PROLIFIC.—Originated in Kentucky, and widely known; a moderate bearer; medium to large, scarlet. Early.

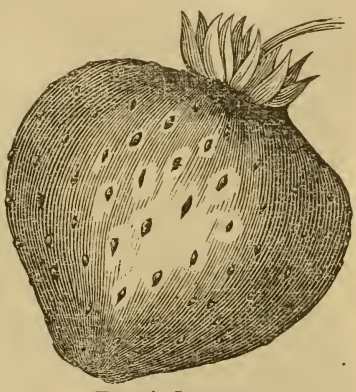
11. DUNCAN.—A chance seedling of some promise, claimed by the owners to be larger than the Wilson, equally productive, and of better quality; bears carriage well.

12. DR. WARDER.—A large, long, good, late berry; firm and moderately productive. Not yet extensively known.

13. FILLMORE.—A good-sized dark-crimson pistillate.

14. FRENCH'S SEEDLING.—Vigorous and productive; a large, conical, dark-scarlet early berry; good, but rather soft.

15 GREEN PROLIFIC.—Very productive and vigorous; large rich foliage; berry large, scarlet, early; pistillate.



HOVEY'S SEEDLING.

16. HOVEY'S SEEDLING.—Old sort; vigorous and hardy; large, conical, bright crimson. A pistillate, widely known East.

17. JENNY LIND.—Productive; large, conical, bright scarlet; very good.

18. JENNY'S SEEDLING.—Large, bright, handsome color; moderate bearer; pistillate.

19. JUCUNDA.—Very large, bright, firm, marketable berry. Very variable; remarkably productive in some localities, in others worthless.

20. KENTUCKY.—Another of Downer's berries. Moderately prolific; large, showy, and good.

21. KERR'S PROLIFIC.—New, and not widely disseminated; very

vigorous, hardy, and productive; large and of good quality; promising.

22. La Constante.—Not hardy; large, conical, red, and handsome, best; sometimes very productive.

Jenny's Seedling.

23. Lady of the Lake.—Hardy and moderately prolific; large, quality good.

24. Lady Finger.—Productive, hardy; medium, long and tapering.

25. Large Early Scarlet.—Old; medium, oval, bright scarlet, good and very early; widely known.

26. Late Prolific.—Large, showy, but variable; not well known.

27. Lenig's White.—Strong, hardy, and productive; medium to large; white, with pink blush.

28. Longworth's Prolific.—Old; vigorous, productive; medium, round, bright crimson; widely known in the West, and at home in a variety of soils. Good, but too small for profit. Cincinnati.

Large Early Scarlet.

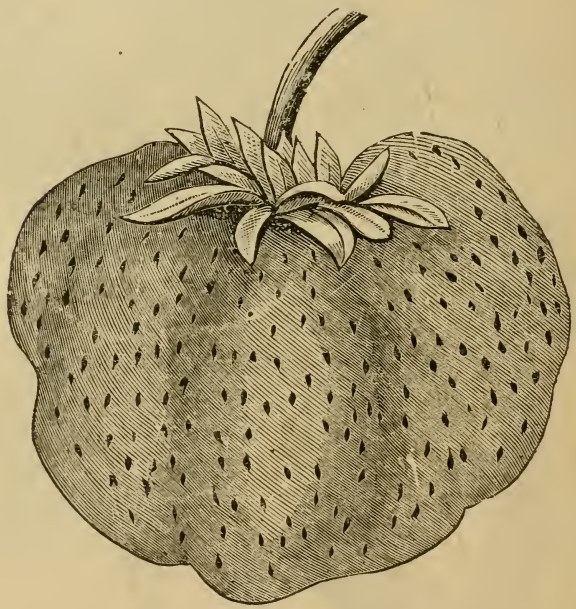
29. McAvoy's Extra Red.—Productive, round, scarlet; a pistillate.

30. McAvoy's Superior.—Another Cincinnati pistillate; vigorous and productive; large; well known.

31. MATILDA.—Seedling of the Jucunda, new; not much known large, showy, and prolific in deep, rich soil.

32. MEADE'S SEEDLING.—A large, red, moderately prolific and handsome pistillate; new, not widely disseminated.

33. MONITOR.—Another of the *Tribune* prizes; vigorous, prolific; large, round, bright scarlet; variable.



TRIOMPHE DE GAND.

34. MONARCH OF THE WEST.—New, and highly promising; vigorous, prolific; very large, good quality and flavor; suited to both light and heavy soil.

35. NECKED PINE.—A medium-sized productive pistillate; old and widely known; light scarlet; early.

36. NICANOR.—Hardy and productive; small, and very early.

37. RUSSELL'S PROLIFIC. — Strong, vigorous, and productive; large foliage; berry large, irregular, dark crimson; suited to many localities, and widely known.

38. PRESIDENT WILDER.—Prolific in suitable soils; late, handsome, firm, very large; promising.

39. RIPAWAM.—Very large, but of poor quality; uncertain.

40. STAR OF THE WEST.—New; not well known, but very promising; hardy, productive, large, handsome.

41. TRIOMPHE DE GAND.—Old, from Belgium; a remakably good berry in different soils; remains long in bearing, with high culture and care. Berry large, firm, handsome, and of good quality; prolific; somewhat irregular in shape.

42. WILSON'S ALBANY.—Very hardy and productive; large to medium; irregular, dark crimson, firm, good, tart; early. Flowers perfect; an excellent fertilizer for other early sorts.

Many more might be named, but the foregoing will suffice. Doubtless, many valuable sorts have been omitted; sorts quite as valuable as many here named.

Among them all, the Wilson's Albany may be regarded as the standard strawberry, as the Concord is the standard grape, and the Dolittle Black-cap the standard raspberry. It is the standard as to hardiness and productiveness—not in quality. It will yield more berries than any other sort, and should be in every collection. Yet it has one serious drawback. Although its earliest fruit is of good size, its later pickings are sure to be small, unless under peculiarly favorable circumstances; and if a dry season, many of the later berries will be worthless.

In conclusion, we would urge all who have leisure and taste for it, to experiment with seedlings. The great want is a strawberry as hardy and prolific as the Wilson, as luscious and handsome as the President Wilder, and as large as the Jucunda or Monarch of the West. That perfection has not yet been reached—is, indeed, a way off—may be positively asserted. Who will originate the COMING STRAWBERRY?

Chapter Fifteen.

THE GRAPE.

The impetus given to the culture of the Grape within the last third of a century, has been one of the most remarkable features in horticulture. The idea that grapes can be produced from our native stock, suitable for the best of wine and for the table, has made a deep impression upon our people. With an unexampled energy and perseverance, the propagation of new varieties has been pushed, until we have now a large number that rank in quality with the foreign, and are far superior in point of hardiness and adaptability to our soil and climate.

Such has been the desire to obtain grapes of superior excellence, that fortunes have been made by many propagators, on varieties that proved in the end to be failures. Some of these, having shone for a time like meteors in the firmament, have gone down in darkness; or, having been tested, have been found unequal to the public requirements.

The successful culture of the grape for wine, has also developed the fact that it can be cheaply grown for table use; that it can be made not only a cheap, but a healthful and nutritive article of daily food--for the many as well as for the few, for the poor as well as for the rich. And it has been shown, too, that its culture, so far from being one of the fine arts, accessible only to the gifted few, can be successfully attempted by the many.

During this period volumes have been written on the culture and management of the grape, much of which had a tendency to deter the common people from engaging in it, even for home use; fearful of the cost and care claimed to be necessary. It has, however, long since been demonstrated that good results can be obtained without great cost, and without that constant care and watching urged by some.

Very much has been written also as to varieties. It is true that all varieties are not suited to all positions, climates, and soils; nor can any one sort be expected to do equally well everywhere.

Years ago, when Horace Greeley offered a large premium for the grape best suited to the wants of the million, and a wise and intelligent committee awarded the prize to the Concord, there was an expression of very great dissatisfaction on the part of many interested and earnest men, and the decision was denounced in severe terms. Yet, as time progressed, and the different sorts became more widely known and tested, the wisdom of the decision has become more manifest, and very generally acquiesced in. And it is safe to say, that to-day the Concord stands at the head of the list as a grape for the million. For its ability to withstand the rigors and vicissitudes of our climate, its freedom from disease and insect enemies, and its adaptability to a variety of soils and locations, few, if any, grapes in the catalogue can compare with it. In the hands of the unlearned and unskilled farmer and village gardener, who cultivate only for their own uses, and not for wine or for market, it will give perhaps better results than any other. Yet there are many grapes its superior in quality; and there are localities where it will not thrive; and we would be far from urging the planting of the Concord to the exclusion of all others.

In all we shall say of grapes and grape culture here, our remarks will have reference to its use as a dessert fruit in the hands of the many. To induce them to plant, and to cultivate, and to use it freely, as a life-giving and health-giving food, is our chief object. Those who design to grow it for purposes of wine manufacture, or to engage in the production of new varieties, or of foreign sorts in hot-house or vinery, will, of course, need more scientific and elaborate treatises.

PROPAGATION.

The grape is easily grown from cuttings—some sorts, however, much more readily than others. Those that are not so easily produced in this way are usually grown in the hot-house or hot-beds, bottom heat being required for the production of roots. This method we shall leave to those who are prepared for it.

For out-door growth the cuttings should be made late in the fall, or during the winter, or in the early spring. They should be cut from well-ripened wood of the new growth, and should be made

about a foot in length, including two eyes, one near each end; if the wood is short-jointed, more eyes may be used, but in no case should a cutting be used with less than two. When cut, they should be tied in bunches of fifty, with the butts all one way; and should be protected from the weather until time for planting. The safest plan to do this, is to bury in the ground in a well-drained soil, below the reach of frost. Or they may be packed in very slightly moistened sawdust or sand, in boxes, in a dry cellar.

In the spring, when the weather becomes sufficiently settled, they may be taken up and planted in good garden soil, previously well-prepared. In planting, make a trench with the plow, or spade, ten inches deep; place the cuttings in the trench at a slight angle, and from eight to twelve inches apart, close against the side, and with the top bud just even with the surface. Then fill in a few inches of earth at the bottom, and press tightly with the foot, continuing the process with less pressure to the top. Level and smooth, and the work is done.

In a favorable season and with free-growing sorts, nineteen-twentieths of them will grow, and with proper tillage will become good plants. The only cultivation necessary will be to keep the weeds down with the hoe, and the ground mellow and moist. If not intended for sale, or transplanting the next season, they may remain another year. Otherwise they should be taken up in the fall, and stored in cellar during winter, packed in earth or sand.

In transplanting, the tops should be cut back to two buds, and the roots shortened in to fifteen or twenty inches.

PREPARATION OF THE SOIL.

Much has been said and written about preparation of the soil for grapes that is calculated to mislead the planter. Some have urged the entire trenching of the ground to a depth of three to five feet, with heavy manuring; others require the digging of deep holes, four by four feet, and filling in with manure and other enriching material; while a third and most reasonable class would only subsoil and drain, in addition to good depth of culture. In all soils suited to the growth of a good crop of corn or potatoes, grapes will flourish, and the plow, harrow, and sub-soiler are the tools necessary for its preparation.

If new ground is used, the stumps and roots should be carefully

grubbed out, as they will be much in the way while planting and in after-cultivation ; and can be easier taken out before than after planting.

The timbered lands of our bluffs are more suited to grapes than the richer and heavier soils of the Western prairies, or the alluvial soils of the river bottoms. Thin soils, with proper cultivation, will produce grapes of a richer and better quality than others ; though the size may not be so great, or the growth of wood so abundant.

TRANSPLANTING

may be safely done in spring or fall, according to latitude. In northern locations spring planting is preferable. Southward, fall is preferred. No certain line of division can be fixed ; but we should say that, as a rule, all south of the latitude of Philadelphia, Columbus, in Ohio, and Quincy, in Illinois, may most safely plant in the fall, while north of those points it is better to plant in the spring.

In fall planting there is this advantage—the young plants can be taken directly from the nursery bed and planted, without remaining out of ground for any great length of time. Whereas, if planting be delayed till spring, the vines must be taken care of for the winter—as heretofore noted—with more or less loss. In any case it is important that the roots shall not be exposed to the weather, or allowed to become dry. In removing from the nursery row, they should be securely packed in damp moss, straw, hay, or litter of some sort, until they are finally disposed of by planting or packing for the winter.

After frost, and the leaves have begun to fall, the fall planting may commence. In spring it should be done as early as the weather becomes settled and the soil in good condition. The last of October, and through November, will do for fall planting ; in spring, the 1st of May.

Fall planting is preferable on this account also—that the soil will become packed to the roots during winter, the new growth of roots will be ready to start, and the plant will commence growing by the usual time of spring planting.

To prevent heaving by the action of the frost, and throwing out the plants—a very serious matter if not prevented—a furrow should be turned on the plants from each side after planting in fall ; or

they should be mounded up with the hoe. This should be levelled down again in the spring.

Having prepared the ground well, as before stated, with plow, sub-soiler, and harrow, run off the distances for the rows with a plow, making a clean furrow nine or ten inches deep—being careful, if crooked, to straighten with a hoe or spade. Then set stakes the proper distances along the furrow, and plant at the stakes. Stand the plant at a slight angle against the perpendicular side of the furrow, and spread the roots nicely each way. Cover and pack the soil well around the roots.

DISTANCE.

Most vineyardists choose to plant in rows about eight feet apart, and eight feet in the row. Some adopt six feet, or even less—according to the variety, and the mode of training. Some of the strong-growing sorts require greater distances. Concord, Isabella, Hartford Prolific, Ives Seedling, Clinton, and such, need eight feet or more; while the little Delaware may do with four or five, and the Catawba, Iona, and similar ones, with five or six. Where ground is plenty, it is best to allow plenty of room.

NUMBER PER ACRE.

An acre of ground contains 43,560 square feet, or 4,840 square yards. It will require for planting the numbers specified in the following estimate, viz.:

At distance of 10 by 10 feet,..... 435 plants.
At distance of 9 by 9 feet,..... .....537 plants.
At distance of 8 by 8 feet,.....680 plants.
At distance of 6 by 6 feet,.....1,210 plants.

For Concords 10 by 10—certainly not less than 9 by 9—is desirable, giving plenty of room for the plow and cultivator, and also sufficient distance to train on the trellis.

Where the ground is level, or nearly so, the rows should be run north and south, thereby giving more sunshine and freer circulation of air. If it be hilly—and it is presumed that grapes will be more frequently planted on hilly and uneven ground than elsewhere—the rows should be run across the slope, so as to make the cultivation as near on a level as possible, in order that the ground shall not wash.

SELECTION OF PLANTS.

In purchasing from a nursery, No. 1 yearling plants are generally preferred. Two-year-old plants cost more in price and for transportation, and are not so likely to live, and will gain little, if any, in point of time. Good No. 1 plants, from honest nurserymen, should have four to eight roots not less than two feet long, and a corresponding growth of top. Before transplanting, all roots should be cut back to eighteen or twenty inches, and the top shortened to two eyes, and these should be set nearly level with the ground.

CULTIVATION.

The young plant should be allowed to take its own course the first year after transplanting. No pinching, no tying-up, is necessary. But the ground should be kept well-tilled and clear of weeds, by the free use of the cultivator and hoe. A row of early cabbages, beans, beets, or other root crop, may be beneficially grown between. In a favorable season, the strong-growing sorts will usually make a growth of five or six feet in length, and, in some cases, as much as ten or fifteen feet, the first year.

TRAINING AND AFTER-CULTURE.

We have now got our plants with two-year-old roots and stems one-year old. The after-management is various. It is best, however, that this one-year vine should not be permitted to bear fruit the next season—which it would do if left to itself. It should now be cut back to two eyes, and protected during winter by a slight covering of straw, or some other light litter.

And here comes up the question of winter protection. What shall be done with our vines, now that we have got them planted and growing? Shall they be protected, or shall they be left exposed to the rigors of the winter, and run the risk of life or death? Some will say—Let them alone; plant only such varieties as will not need winter protection. Others, claiming that whatever is worth doing at all, is worth doing well, advise protection. It is very desirable, certainly, that we shall be able to secure such varieties as will withstand the rigors of our winters without this labor and care; and there are such; but it must be confessed that they—as in the case of many other fruits—are not of the best sorts. It is, also

equally evident that, as a rule, the great mass of grape-growers—the million—*will not*, however much they may be urged, be induced to adopt any system of winter protection that involves care and trouble.

The Concords, the Clintons, the Ives, the Nortons, and others, may get along safely through most winters without protection. But if we expect to obtain the luscious Delaware, the Rebecca, the Maxitawny, or even the Catawba, we must make up our minds to protect.

The mode of protection usually practiced is to lay the vine down upon the ground, and cover with earth to the depth of an inch or two. This requires that the annual trimming shall be done in the fall, before the freezing weather commences. In most vineyards, where protection is not practiced, this work is omitted till in the winter or early spring.

This question of protection we shall leave for each one to judge for himself, according to circumstances; with the additional remark, that of the varieties named in the succeeding list, probably one-half had better be protected north of Ohio and Pennsylvania, while the other half may get along without it.

Different modes of training are adopted. Some tie to stout stakes, six or seven feet high, one to each plant. Where wood is scarce and costly, this is an expensive mode. The most common method is to use a trellis of wire. For this purpose posts are set in the ground at proper distances—say twenty feet—and wire fastened to these horizontally. The posts at the ends should be firmly set and braced, in order that the strain of the wire shall not loosen them. The wire is fastened to the posts by means of small staples, to be had at the hardware stores. Three wires are usually required, placed twenty inches or two feet apart, and the lower one a foot or so from the ground.

Manufacturers now supply a wire especially for the purpose. This annealed wire, No. 12, is strong, and will answer; but No. 10 is heavier, and will last longer. To wire an acre of trellis, the cost will be from thirty to sixty dollars, while the posts at ten cents each, may bring the sum total from sixty to one hundred dollars, according as wood and labor are costly or cheap. Inferior trellis, made of split or sawed slats, may be obtained at cheaper rates in places where wood is plentiful. A primitive mode of building a trellis, is to use split poles, obtained from the woods when the bark

will peal; these, while answering a present purpose, will be of short duration.

PRUNING.

On this subject there is great diversity of opinion, and the limits of this work will not permit of a lengthy treatise on the subject. It is proper to say, that the tendency to vine-growth is a check to fruiting; and that cultivators consider it necessary to counteract this excessive growth by pinching and pruning. Many carry this practice to excess; and with spring and summer pinching, and fall and winter pruning, we believe very materially injure their vines.

In this description of the pruning process, we shall condense from various treatises on the subject. Buchanan, a practical Cincinnati vineyardist of several years ago, says:

"In the second spring after planting, cut down to two or three eyes, or joints, and the third year to four or five; pinching off laterals and tying up. * * Pruning the fourth year requires good judgment, as the standard stem or stalk has to be established. * * Select the best stem or cane of last year, and cut it down to six or eight joints; * * the other cane cut down to a spur of two or three eyes, to make bearing wood for the next season."

His mode has reference to tying to upright stakes, instead of trellis, and must be varied accordingly. He says: "In the succeeding and all subsequent years, cut away the old bearing wood, and form a new bow, or arch, from the best branch of the new wood of the last year, leaving a spur as before, to produce bearing wood for the coming year; thus keeping the old stalk of the vine down to within eighteen to twenty-four inches from the ground. The vine is then always within reach and control." This is the renewal system.

Spur pruning consists in continuing the old or main stem, and annually cutting back the laterals to two or three good buds. A blending of the two is often practiced.

For summer pruning, we can do no better than to quote from Husmann, a noted grape-grower and writer in Missouri. He says:

"We are glad to see that the attention of the grape-growers of the country is thoroughly aroused to the importance of this subject, and that the practice of cutting and slashing the young growth in July and August is generally discountenanced. It has murdered

more promising vineyards than any other practice. But people are apt to run into extremes, and many are now advocating the 'let alone' doctrine. We think both are wrong, and that the true course to steer is in the middle.

"1. Perform the operation EARLY. Do it as soon as the shoots are six inches long. At this time you can oversee your vine much easier. Every young shoot is soft and pliable. * * Remember that the knife has nothing to do with summer pruning. Your thumb and finger should perform all the work, and they can do it easily if it is done early.

"2. Perform it thoroughly and systematically. Select the shoots you intend for bearing wood for next year. These are left unchecked; but do not leave more than you really need. Remember that each part of the vine should be thoroughly ventilated, and if you crowd it too much, none of the canes will ripen their wood as thoroughly nor be as vigorous as when each has room, air, and light. Having selected these, commence at the bottom of the vine, rubbing off all superfluous shoots, and all which appear weak and imperfect. Then go over each arm or part of the vine, pinching every fruit-bearing branch above the last bunch of grapes.

"We come now to the second stage of summer pruning. After the first pinching, the dormant buds in the axils of the leaves, on fruit-bearing shoots, will each push out a lateral shoot opposite the young bunches. Our second operation consists in pinching each of these laterals back to one leaf *as soon* as we can get hold of the shoot above the first leaf, so that we get a young, vigorous leaf additional, opposite to each bunch of grapes. These serve as elevators of the sap, and also as an excellent protection and shade to the fruit. Remember, our aim is not to rob the plant of its foliage, but to make *two* leaves grow where there was but one before, and at a place where they are of more benefit to the fruit."

INSECTS AND DISEASES.

Mildew and *rot* are the chief diseases affecting the grape, and are both believed to be caused by atmospheric influences. Excessive rains and damp, sultry weather are deemed the chief causes of these allied diseases. No specific remedy has been found, as no means of preventing the recurrence of the unfavorable causes are within human reach.

Of *Insects* there are several that are quite destructive to the grape plant, among which the most formidable is the phylloxera, a tiny insect which, in its several stages, is lately making deadly havoc among the vineyards of both Europe and America—affecting the roots as well as the foliage. In its work upon the foliage it does comparatively little injury, but its work upon the roots is very destructive—eating away the fibrous portions, and causing them to decay and die.

Against the ravages of this insect there is as yet no known satisfactory remedy. Large rewards have been offered in Europe to stimulate discovery, and in America the entomologists and others are diligently pursuing their investigations.

The *leaf-hopper* is a troublesome insect on some varieties. It is an active little beetle, and works on the underside of the leaves, causing them to assume a deadly appearance in spots, and finally killing the leaf entirely. Soapsuds has been recommended as a remedy, also tobacco infusion thrown upon them with a syringe.

The *leaf-folder* is a green worm that folds itself up in the leaf, where it goes into the chrysalis state. The parent moth appears in the spring and deposits her eggs, which hatch and fold themselves up during the summer. The increase of both this and the leaf-hopper may be checked by raking up and burning the leaves in the fall.

There is also a *grape curculio*, inferior in size to the plum curculio, but with habits somewhat similar. It punctures the fruit and deposits an egg, which hatches a worm to live on the juices. This larva leaves the berry during summer, and passes into the ground. It is believed, however, to issue again in the fall as a beetle, and thus pass the winter.

Many other more or less destructive insect enemies of the grape might be mentioned.

VARIETIES.

In this list of some fifty or sixty varieties we shall divide them into two classes—first, the old and well known sorts; and, second, the newer productions which are proving or promising well. While many of them are known specially as wine grapes, our aim is to furnish a list of grapes for the table—for food rather than for drink—and suited to the wants of the million.

DELAWARE.

Of the *older sorts* we mention only the following:

1. BLAND.—A Virginia variety of good quality, best adapted to the South; only a moderate bearer. Bunches long and loose, berries of a pale red color; late.

2. CAPE, OR BLACK CAPE.—(Muscadel, Vevay, Alexander, etc.) This grape was used years ago by the French at Vevay, Indiana, and is a seedling from the woods. It was cultivated long as a wine grape, and was considered best until superseded by the Catawba. Bunches compact and not shouldered; berries medium, black, pulpy, coarse, sweet and musky; last of October.

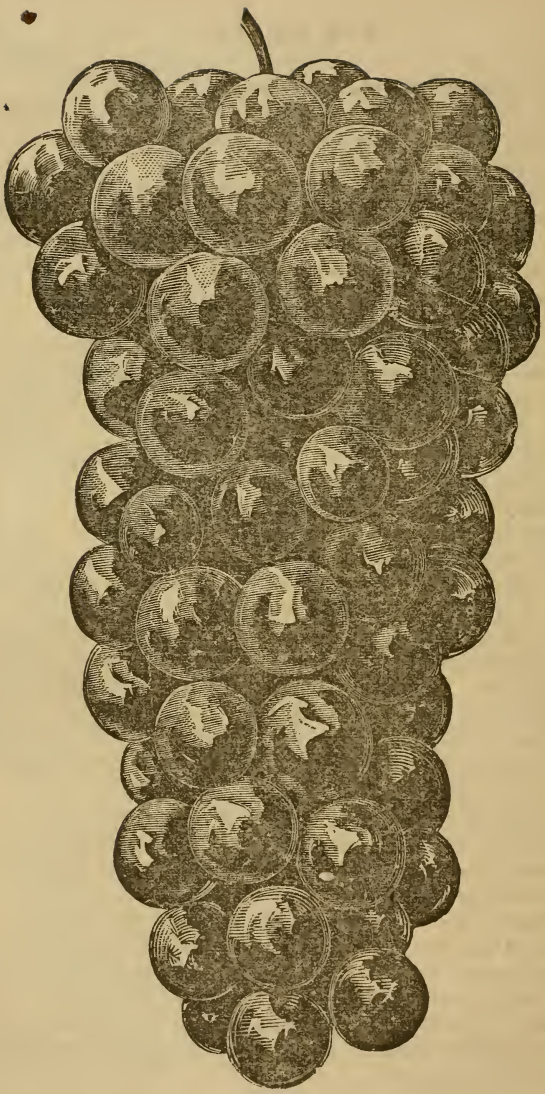
3. CATAWBA.—The Catawba was long the rage in the West and elsewhere as a wine grape, and is a really fine grape both for wine and the table. But its popularity is on the wane, as it is subject to mildew and rot. Origin, Catawba river, North Carolina. Bunches large and handsome, shouldered; berries large, round, red; sweet, pulpy, juicy; very productive, vigorous grower, but unreliable, except under most favorable conditions.

4. CLINTON.—Origin, New York. A very hardy black grape of inferior quality. Bunches small; berry small, black, with blue bloom; round; acid, juicy. Hardy, vigorous, very productive; straggling. Not thoroughly ripe till after frost.

5. CONCORD.—Origin, Concord, Mass. This, the acknowledged grape for the million," has lately been more extensively planted than all others. It is a hardy, strong grower; healthy, strong foliage, free from insects. Bunch large and shouldered; berries round, large, black, with blue bloom; sweet, juicy, tender; remarkably productive. A Concord vine should be in every farmer's garden, and on every villager's lot.

6. CREVELING.—Origin, somewhere in Pennsylvania. A hardy vine, but not reliable for productiveness. Bunches variable; berries large, oval shaped; black, blue bloom; quality excellent; early. A good table grape.

7. DELAWARE.—The *ne plus ultra* of excellence. Origin, not established, but first brought to public notice at Delaware, Ohio. A hardy, slow-growing, slender, and very unreliable grape. Bunches small; berries small, round; sweet, rich, juicy, and delicious; red, beautiful. The Delaware is justly regarded as No. 1 in quality. In some localities Southward it succeeds well, but as a general thing is regarded as not reliable.



IVES.

8. DIANA.—A Catawba seedling. Origin, Massachusetts. Not reliable, except on dry and gravelly soils. In localities suited to its requirements it is an excellent grape. Bunches medium in size, sometimes shouldered; berries also medium; round, red, sweet and musky. Ripens a little before Catawba. One of the best of keepers.

9. ELSINBURGH.—Origin, New Jersey. A good early grape, with large loose bunches; medium, black berries; sweet and rich. Often mildews.

10. HARTFORD PROLIFIC.—Origin, Hartford, Conn. One of the earliest. Vine healthy and productive. Bunches large. Berries ditto, round, black; quality not best. A good market sort on account of its productiveness and early ripening.

11. HERBEMONT.—Origin in the South, and peculiarly a Southern wine grape. Will not succeed well north of Tennessee without protection. Bunches large and compact. Small, black berries; sweet and rich in flavor. Productive on poor soils.

12. IONA.—One of Dr. Grant's seedlings at Iona Island, N. Y. A good grape, but not deserving the fulsome praises that were bestowed upon it by its originator. A seedling of Catawba, and but little superior in quality or reliability. Bunches large. Berries large, red; rich, excellent. Ripens about with its parent.

13. ISRAELLA.—Another of Dr. Grant's much-praised seedlings. Bunches large and handsome; berries black, a little oval; not quite so good in quality as the Iona. Is said to answer well for the South.

14. ISABELLA.—This is an old and well-known grape. Origin, South. Bunches large, with oval and nearly black berries; juicy, musky, and somewhat acid. Long a favorite in some quarters, but inferior in quality, and not to be recommended.

15. IVES' SEEDLING.—Origin, Cincinnati. One among the best of wine grapes, and fair for market. Bunches rather large; berries medium, purple changing to black. Sweet and foxy. Keeps well.

16. LENOIR.—Origin, South. Like the Herbemont, best suited to that region. A good grower, and said to be good for both wine and table.

17. LOUISIANA.—Origin, Louisiana; but claimed by some to be a native of France. Bunch medium; berries small, black, sweet and rich; healthy, and much esteemed in the South, to which it is only suited.

AGAWAM.

18. MAXITAWNY.—A so-called white grape. Origin, Pennsylvania. One of the best pale grapes grown. Bunch small, or medium ; berry, medium ; pale yellow, delicious quality. Very hardy, but rather late for the North.

19. NORTHERN MUSCADINE.—Origin, New York. Bunch, medium and close ; berry, quite large ; reddish brown ; foxy, sweet ; much esteemed by some. Good grower and productive. Early.

20. NORTON.—Origin, Virginia ; noticed by Dr. Norton, of Richmond—from whom its name. Very popular as a wine grape. Bunch long and shouldered ; small black berry ; sweet, with little pulp. Late—Oct. Hardy, productive.

21. REBECCA.—Origin, New York. A very tender white grape, of excellent quality ; needs protection. Bunches, medium ; berries, medium, or small ; greenish yellow ; sweet, musky ; not reliable.

22. SCUPPERNONG.—Origin in the South, and cannot be grown North. A very popular grape in the Southern States. Bunches very peculiar, small ; berries very large, yellowish, ripening one at a time. Most luxuriant growth.

23. UNION VILLAGE.—Origin, Ohio. Very large ; equal to the Black Hamburgh. Thought to be an Isabella seedling, and nc better. Vine tender ; not reliable.

24. VENANGO. —(Miner's Seedling). Origin, Pennsylvania. Bunch, medium ; berries, rather large ; pale red ; foxy and sweet. Very hardy and productive.

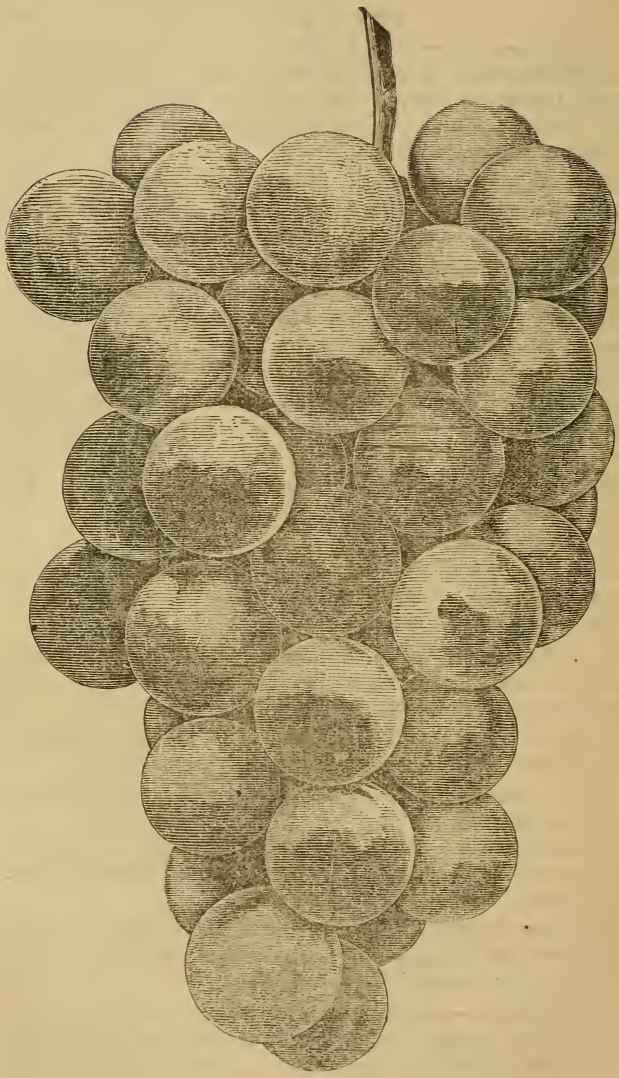
25. YORK MADEIRA.—Origin, York, Pa. A probable seedling of the Isabella, which it resembles, but scarcely equals.

Of *Later Introductions* there are a vast number, from which we select the following, viz. :

26. ADIRONDACK.—Origin, New York. Thought to be another Isabella seedling ; early and of first rate quality. Bunch and berry large ; black ; oblong, juicy. Not reliable.

27. AGAWAM.—One of Rogers' Hybrids, Salem, Mass. Large in bunch and berry ; good quality ; vigorous and productive. Ripens about with the Concord. Quite promising.

28. AUTUCHON.—One of Arnold's Hybrids. A new white grape originated in Canada. Long, loose bunches and small berry, greenish white, melting and agreeable. A cross between the hardy



GOETHE.

Clinton and Foreign Golden Chasselas. Promising for an amateur grape.

29. BARRY.—Another of Rogers' Hybrids, and very promising. Of medium size, black, tender, and sweet. Vine quite hardy and productive. Ripens before the Concord.

30. BELVIDERE.—Origin, Belvidere, Illinois. Thought to be a seedling of the Hartford, on which it is an improvement in quality and hardiness.

31 BLACK DEFIANCE.—A very promising grape, seedling of the Concord; larger than its parent, and of better quality, but considerably later.

32. BLACK EAGLE.—Origin, New York. A very promising new grape of great beauty in both fruit and vine; earlier than Concord, and superior in quality. It is quite free from disease, and hardy.

33. BLACK HAWK.—Origin, Missouri. Another of the large Concord family; said to be better and a week earlier. Foliage nearly black. Promising.

34. BRIGHTON.—A new grape, originated by Mr. Moore, near Rochester. It is a Concord-Diana-Hamburg cross. Bunch large, shouldered, and compact; fruit round, red, with purple bloom, not quite so large as Concord. Strong and healthy grower; productive, but not free from mildew. Very promising.

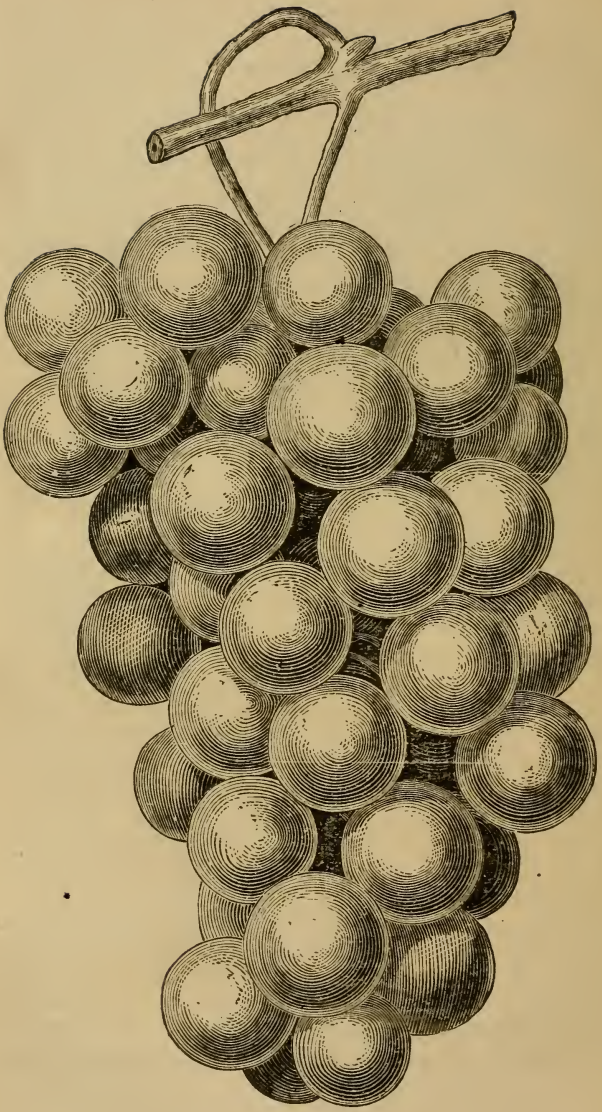
35. CAMBRIDGE.—Origin, Cambridge, Mass. Described by Hovey & Co., of Boston, as being a black grape somewhat resembling Concord, "but more nearly approaching the Adirondack in quality than any other native grape;" "and we do not doubt it will attain an equal, if not a higher rank than that variety." Worthy of trial.

36. CHALLENGE.—Origin, New Jersey. A Concord cross with Royal Muscadine. Extra hardy, and very promising.

37. CHAMPION.—Origin, New Orleans. Earlier than Hartford, and promising for the South.

38. CONCORD CHASSELAS, and 39, CONCORD MUSCAT.—Both, as their names indicate, crosses of the Concord with foreign grapes, produced by Geo. W. Campbell, of Delaware, Ohio; both light-colored grapes of good quality, but not superior if equal to the Concord in productiveness and hardiness.

40. CROTON.—A much-vaunted white grape, produced by Under-



LADY.

hill, of Croton Point, N. Y. ; a cross of the Delaware with Chasselas de Fontainbleau. Not sufficiently tested yet. Elliott pronounces it among the green (or white) "what the Delaware is among the red."

41. DIANA-HAMBURG.—Origin, Rochester, N. Y. A cross, as its name implies ; a large, good grape, ripening before the Diana. Tender, and unsuited to open-air cultivation.

42. ESSEX.—Rogers' Hybrid ; very large and black ; tender and sweet ; early and prolific. Promising.

43. EUMELAN.—Another of the much-praised Dr. Grant grapes Bunches and berries large ; black, first quality, and very early. Productive and hardy, though somewhat variable.

44. GOETHE.—One of Rogers' Hybrids. A very hardy and productive late variety of white grape. Bunches medium, with large berries ; color, green yellow, first quality. Very promising.

45. HINE.—Origin, Kelly's Island, Lake Erie. A grape supposed to be a cross of the Catawba and Isabella, though regarded as highly promising. Medium in size, color of Delaware.

46.—HUMBOLDT.—A Missouri grape of promising character. Small, green color. Very good quality.

47. IRVING.—Origin, New York. Another Concord seedling, white and large ; healthy, late, and good keeper.

48. LADY.—One of Campbell's Concord white grapes. Claimed by him to be equal to the Concord in hardiness, and superior to the Martha as a white grape. Very early, and highly promising for the table.

49. MARTHA. - Origin, Penn. A white seedling of the Concord. The most popular of the white varieties. Medium size, sweet, greenish white to pale yellow

50. MASSASOIT.—Rogers' Hybrid, widely disseminated as No. 3. Early as Hartford, and promising for the dessert.

51. MERRIMACK.—Rogers' No. 19. One of his best. Bunch small, with large, black berry ; good quality ; ripens late.

52. NORTH CAROLINA.—Origin, Pennsylvania. Large, black, sweet ; quality fair. Great grower and hardy.

53. PAULINE.—A promising Southern grape of very good quality, but not suited to the North.

MARTHA.

54. PERKINS.—Origin, Mass. Very early, resembling Diana. Healthy and promising. for market.

55. SALEM.—Rogers' No. 53. This is a widely-known new grape, much praised. It is a cross between a native and the Black Hamburg, and is a very large berry on a large and well-shaped bunch; color, light red, and quality very good. Like most of Rogers' grapes, it is not quite hardy enough to take the place of the Concord for general culture. In favorable positions, it is a very desirable grape, and should be widely placed on trial.

56. SEASQUA.—A Concord-Black Prince cross, from Underhill, has some of the characteristics of its foreign parent. Is regarded as a valuable fruit for amateur culture, and not as reliable as the Concord.

THE WALTER.

57. TRIUMPH.—Another of Campbell's Concords. Very large, white; considered to be valuable for the South.

58. UNDERHILL'S CELESTIAL.—Origin, New York. A good grape, said by Campbell to be "of more value than the Iona." Not yet widely disseminated.

59. WHITE DELAWARE.—One of Campbell's Delaware seedlings. Not even as large as the parent, but much more promising in vigor and ability to resist disease.

60. WALTER.—A Diana and Delaware cross. Origin, New York. A much-praised grape that has been pretty widely disseminated with widely differing results. It is of excellent quality for the table, and is also said to make a good wine.

61. WILDER.—One of Rogers' Hybrids, and one of his most promising. Very large berry and bunch, color dark purple. This grape has been sent out as No. 4, and has proven to be one of the most productive, hardy, and vigorous of the lot. Ripens with Concord, and keeps well.

Many more promising grapes might be added to the foregoing list; but it is sufficiently extensive. Many eminent propagators with a praiseworthy zeal, are engaged in the work of hybridizing, in the hope of producing still greater results. And we may close this very incomplete chapter with the remark that, until that long-sought *Coming Grape* is found, the CONCORD must still hold its place as first for general culture in the United States.

For the use of many of the cuts in this chapter we are indebted to Messrs. Bush & Son & Meissner, Bushburg, Mo.

Chapter Sixteen.

[*CONCLUSION.*]

LAST WORDS.

AND now for a few closing words. This little book is not addressed to scientific or professional fruit-growers. Neither is it intended for that growing class of amateur cultivators, who, having fortunes at command, can revel in all the luxuries of hot-house culture, and care little for the ordinary means that lie within the reach of the humble citizen. It is not for them; yet they MAY find in it something to interest them.

But it is designed for that large class of toilers all over the land—on the farms, in the villages, and even in cities—who earn a living by the sweat of their brows. They, as a class, are presumed not to be posted very well in the matters herein contained. If these—if but a meagre portion of them—can be reached and benefited by its contents, the writer will be amply satisfied. If they can be thereby persuaded to plant, to till, to train, and TO LOVE these luscious and health-giving gifts from a beneficent Creator, he will be sufficiently repaid for the labor bestowed upon it.

Of the *Tree Fruits*—apples, pears, peaches, cherries, etc.—it is presumed the farmers are better supplied than any other class. Those in the Eastern and older-settled portions of the country, of course have their bearing orchards, from which to draw their supplies. But their Western brethren are not so well provided for. The occupant of a "dug-out" in Kansas or Nebraska, or of a log-cabin in Missouri or Arkansas, is compelled to forego these luxuries for a time. But each may, by a timely effort, and little expense, provide himself with a liberal supply of the small fruits. And some of them do—we are glad to say—far outstrip many of their Eastern friends in that respect. The tree fruits require several years to produce a return; but grapes and the berries can be had much

earlier. Strawberries give the best return the second year after planting; raspberries will give a small yield; blackberries, ditto, grapes will give a good small crop the third year; currants and gooseberries the same; while the care and management of them all is not beyond the capacity of any intelligent-minded person.

Every occupant of a village lot of fifty by one hundred and fifty feet, has room, in addition to his dwelling, stable, and out-houses, for a liberal supply of these fruits. He can have a pear, a cherry, and a peach tree—perhaps more than one of each; or he may add an apple and a quince. Then he has room for a Concord, an Ives, an Eumelan, and a Lady or a Martha grape; a dozen Mammoth Cluster and Davidson Thornless raspberries, and a rod or two square of strawberries. He who is thus situated, and has never tried it, will be astonished at the amount of good living to be derived from a judicious selection and care of even these.

If possessed of an acre, or but half an acre, he can largely multiply this list, and add apples, currants, gooseberries, etc., and have vacant ground enough to grow all the potatoes, cabbages, tomatoes, beans, and sweet corn he will need for his family.

If a farmer, tilling his broad acres, no apology will excuse the want of at least three acres to orchard and garden for home use; one to apples, one to pears, peaches, etc., and one to grapes and other small fruits. They should be enclosed separately—the orchard from the small fruits; as it is important often that hogs and sheep be permitted the range of the orchard, in order to aid the owner in the destruction of the pests to which it is subject. The small-fruit lots should be religiously guarded against such intrusion.

But, let all planters of commercial orchards especially beware lest they get too many varieties. And let them also guard against planting many of the fall-ripening apples. There is an annual loss of millions of dollars due to this cause alone. There are hundreds of summer and fall apples planted, throughout the country, where dozens would be too many. In a commercial orchard of five hundred trees twenty to fifty would be ample for summer and fall use; these should consist of a few well-known and reliable sorts; while the remainder should be one, two, or three of the hardy, productive, and saleable varieties, of good flavor and long-keeping qualities. The markets are annually crowded, during the fall months, with

non-keeping varieties, at ruinous prices, while during late winter and spring, late-keepers will sell at fair rates. Or thousands of bushels are either wasted in the orchard, or made into cider, or fed to stock, at a loss.

Those who plant for home use only, are also extremely apt to fall into this mistake. In an orchard of fifty trees for home consumption, at least forty should be winter apples—most of them late-keepers—such as will, with proper handling, last into mid-summer, until the early fruits come again. The other ten should be choice selections of early and late summer, and early and late fall, in order to have a regular succession. Of course these suggestions are to be varied according to circumstances.

Many planters, having acres to spare, and means, desire to experiment on varieties. They select, very properly, a great many varieties; yet even they sometimes mistake, by taking too many trees of a kind. One tree of each sort is enough to experiment with, if the design is to enter into it largely. And even then, it is a question whether it might not be more cheaply done, by top-grafting several sorts into one tree.

The above suggestions will apply equally to the planting of pears and some other fruits.

A word to peach-growers everywhere—especially throughout the West and South. The markets are full of small and insignificant seedlings, which bring a poor price by the side of good, large, cultivated sorts. To the growers of all such, we say—cut them down; do not encumber the ground with trees that bear such fruit. Fill their places with such as will sell, and be in demand as soon as seen. It is not uncommon to see peaches in large quantities, in some of the Western markets, going slowly at forty and fifty cents per bushel while by their side are others that are readily sold at two dollars per bushel. There is no profit in that sort of fruit-growing. Yet the writer is well aware that a poor peach is better than none; but there is no excuse for having a poor peach. The budded varieties, and the seedlings that are known to come true to the parent stock (and there are such, valuable peaches, too), are the only ones that should be planted; either for home use or for market.

PLANT – PLANT! Plant the best, always, if to be obtained; if not, plant such as can be had. Of those that grow on trees, and tempt

the eyes and palates of men, women, and children, with their ruddy and golden cheeks; of those, too, that nestle upon the ground, or hang in bunches among the briars and thorns, or are suspended from the trellis; beautiful! luscious! life-saving! health-preserving fruits of the earth! PLANT! EAT! AND BE HAPPY!

APPENDIX.

CURCULIO.

As this formidable insect is the great enemy of the peach, as well as the plum, nectarine, and apricot, a description of it, and of its habits and manner of operation, and the modes of destroying it, may as well be given in this place.

To most practical orchardists, the curculio needs no introduction; yet there are thousands who know something of its ravages, who are ignorant of its mode of operations, and never saw one in its perfect state.

A full-grown curculio resembles at first sight a grain of buckwheat in size and color. It is hump-backed, has a long, tapering head, and its wings when spread present a glassy appearance. It winters in the ground, from which it emerges usually in the month of May – earlier or later according to the season. But when the young fruit has attained a proper size, the insect is generally ready to commence its work. This work is the propagation and reproduction of its species. The female deposits her eggs in the young fruit, when as large as a pea—making an incision shaped somewhat like a half-moon. This business she continues to follow industriously for a month or more. How many eggs one female curculio will thus deposit in a season, may never be known; but it is known that the larva from her first deposits have arrived at maturity before her labors are ended.

This egg, thus deposited beneath the skin of the young peach, hatches a minute whitish larva, which works its way into the fruit and feeds upon its juices. If the fruit be young, this work of the insect entirely destroys it, and it falls to the ground. Fruit that has reached a considerable size before being stung, sometimes maintains its hold upon life, and ripens, with or without the presence of the insect. But such is generally worthless. These insects enter the ground again from the fallen fruit, and in turn come up the same season or the next, to begin the work of their parents. We thus see how numerous a family of curculios in an orchard may become, and how destructive their work may be, if not molested.

The remedies against the work of the curculio may be divided into three classes: First, those directed against it while in the ground; second, while depositing its eggs in the fruit on the tree; and third, while in the fruit in the larva state.

1. Paving with brick, stone, or boards, or beating down and tramping the soil beneath the trees, has been recommended and practiced; but while this may be partially successful, it cannot be relied on. For, while one man may destroy his own, his neighbor's orchard may supply him with another brood—as the insect can fly, and emigrate from one orchard to another, and from the forest.

2. The most successful, and perhaps the only successful mode of warfare against them, is while in the beetle or winged state. The fumes of burnt sulphur have been used to drive them away. The sprinkling of the tree with powdered sulphur, or slaked lime, when the dew is on, or after a rain, has also been successfully practiced. But the jarring of the trees, and catching the insects as they fall, is the surest and most certain remedy. The habit of the animal is to drop when disturbed, and lie still.* The tree should be jarred with a sudden and quick motion (not shaken); and care should be used that the bark be not injured. A stroke with a heavy mallet, or some padded substance, will bring them down, if the tree is not a large one. If the tree be only shaken, they will fly away, or cling to their position.

3. Many insects may be destroyed while in the larva state, by a careful picking of the punctured fruit as it falls from the tree, and before the worm has had time to emerge. Such should never be allowed to lie after falling, but should be eaten by the hogs.

4. It is yet an unsettled question whether barn-yard fowls will eat the curculio; yet experiment has shown that they can be successfully employed against them. It is notorious that where these have been allowed to run, and to scratch, under the fruit-trees, full crops have been obtained. Whether the insects are caught and destroyed by the fowls, or only driven away to a more quiet field of operations, has not yet been fully decided. In either case the fruit is saved. Fowls can be induced to do an unusual amount of scratching, by strewing a handful of corn-meal daily under the trees.

Many devices have been adopted for catching the curculio while in the winged state. A machine invented by the late Dr. Hull, of Illinois, and known as the "Curculio-Catcher," has been much used in the West, and is perhaps the best implement known for the purpose. It is constructed somewhat like a wheelbarrow, with a large umbrella-shaped cloth stretched over it, inverted—on which the insects will fall as the tree is jarred, and roll down into the centre, into a vessel of water. A padded battering-ram projects in front, and may be made to strike and

jar the tree, without letting go the handles. The cloth is so constructed as to pass each side of the tree, by means of a slit from the front edge to the centre. This implement can be run from one tree to another, and quite a large orchard jarred in a day.

A few dollars will construct one of these machines; and a vigilant and persistent use of it during the summer, will save nearly the full crop of stone-fruits, which otherwise would be a total loss. To large planters, it or some similar device is indispensable; as it has been found that no other warfare is so effective as that directed against the perfect insect.

Cotton-growers in the South, and tobacco-growers in the Middle States, are compelled to maintain a vigilant warfare against their insect enemies. So the fruit-growers, both North and South, must make up their minds to maintain the same unceasing warfare. The war must be carried forward with the same persistency; and when so, under Providence, we will achieve the same success.

But fruit-growers pay too little attention to the study of insect life and habits. As we become acquainted with them better, we shall doubtless be better able to cope with them, and check their devastating ravages.

PEAR BLIGHT.

No branch of fruit culture has been attended with more difficulties and discouragements, and resulted in more failures, in the United States, than that of pear culture. And on no subject has there, perhaps, been more diversity of opinion, even among the most intelligent and scientific cultivators. No theory of culture, or cause, or cure of disease, seems to be practically accepted, as in the case of many other fruits.

Some planters in almost every section have been eminently successful for a time; then, of a sudden, their luck would turn, and they could thenceforward only achieve failure and disaster. Others have been met with these results from the beginning.

Twenty years ago, when pear culture was in its infancy throughout the West, and failures had not become so common in the East, as to cause the present existing doubt and dismay, many bright anticipations were entertained. Thousands of trees were planted, with the hope of fortunate returns, that have since died and been consigned to the brush pile.

A great deal of this disaster has been caused by the neglect of the planter—as in the case of other kinds of fruit; much has been due to the improper choice of varieties; and much to the propagation of many sorts upon the quince, for dwarfs, which were ill adapted.

But the pear—although in cultivation in this country from a very

early day, and even now specimens are known of over a century old—is really but little understood, as to its natural habits, the food necessary for its proper nutriment, and the cause of its diseases. Theories based on what have seemed to be the best of reasons, have signally failed in many instances. And often whole orchards, embracing many sorts, and composed of both standards and dwarfs, have died in a few years, and no known remedy would save them.

The most serious and the most devastating of the diseases to which the pear is liable, is the blight. It seems to be confined to no particular locality; to make its appearance in all sections of the country; and in a great variety of soils. Many remedies for it have been proposed and tried; and while some, perhaps all, have seemed successful in some cases, *all of them* have signally failed in others.

This blight is insidious in its attacks. It begins, no one knows *where* —and, we believe, no one KNOWS WHY. It resists any and every attempt at cure. It will attack old trees in the orchard and young trees a year or two old in the nursery; and it will spare others of the same varieties by their side, under the same sort of culture and in the same character of soil; and no man can tell why one is chosen and the other is left. It will destroy an orchard of dwarfs in a few years, while a mile distant an orchard of standards has gone the same way. Underdrained and highly cultivated trees, as well as those subject to moderate culture, and those with no culture at all, are all liable to its attacks. It will appear in a score of places in remote parts of the tree at the same time—in the foliage, in the twigs, in the bark of the branches, and on the stem; while other bark and foliage on the same twigs and branches remain untouched. It will cause the half-grown fruit on one large or small branch to wither and blacken, while that on a contiguous branch will remain sound to maturity. Foliage, twig, and fruit, on some branches, will remain green and untouched, while probably a foot in length below, on the same branch, the bark all around the stem is black and dead. Usually, during the Fall, or the succeeding year after the attack, the whole tree dies.

Such is PEAR BLIGHT—as the writer has seen it in numerous instances, and as it has appeared all over the country; blasting the hopes of the planter, upsetting the speculations of the theorists, and defying the skill of the scientific investigator. It is a gloomy picture, but a true one. Millions have been lost to the country by it, and will continue to be—how much longer, the Disposer of events only knows.

Under such a state of facts, it can hardly be expected that we shall offer any remedy. We know of nothing that is at all reliable. Yet certain conditions have been found more favorable than others. A dry, well-drained soil, not too rich, highly manured, is deemed most

suitable. Moderate pruning, to keep in proper shape; if the tree be eight or ten years old, allow a moderate grass sod; if younger, give a little cultivation. Moderate top-dressings of lime, ashes, iron scrapings, salt—all are recommended, not as known remedies, but as likely to be beneficial. A wash of lye and soft-soap, with a mixture of lime, cannot be injurious; and at least will be a protection against insects.

It would seem almost useless to refer to the many remedies for the blight, which have been given to the country from time to time—since all remedies have so signally failed. Some years since, the late Dr. Hull, of Illinois, a cultivator of much practical skill and experience, put forth a claim in favor of root pruning as a certain remedy. It has been practiced by many with varied success; but it is believed that, though it may in some instances be beneficial in arresting the disease, it can in nowise be classed as a remedy.

Cutting away the diseased branches, as soon as the disease begins to show itself, has also been urged as an infallible remedy; but those who urge it could have had but slight acquaintance with the disease. To cut away all the parts affected, would be to cut many trees into stove-wood—about half of which would show symptoms of blight, and the other half would not; but so located as to render separation impossible, except by its total destruction.

Thomas Mcehan, the intelligent editor of the *Gardener's Monthly*, at Philadelphia, recommends the growing of pears in grass sod, as a preventive of blight; and many exp riments have seemed to demonstrate the value of the suggestion.

As a rule, it is believed that those varieties which have been known to withstand our variable seasons best, will be most likely to escape the ravages of the blight. And yet this is not an established fact.

In conclusion, it is safe to say, that the whole field of horticultural investigation presents no question upon which there is more present need of light, than that of Pear Blight.

PROPAGATION.

PROPAGATION is properly the business of the nurseryman. But it is desirable that others should know something of the art and its principles, so a short chapter is given to it here. In doing so, we must necessarily confine ourselves to a limited space, and leave much to the judgment and good sense of the reader.

All new varieties are produced from seeds, either by natural or artificial means. Hybridization, though artificial, is, however, only an application of the operations of nature. It consists in applying the pollen, or fertilizing portion, of one variety of blossoms to the

pistils of another sort—thus producing a cross between the two; a union which transmits the qualities of each parent to the offspring. What we call the natural process, is when the same result is obtained by the action of the winds, by insects, or other causes unknown.

But when varieties are once obtained, seeds can not be relied on for their re-production. This is brought about by several modes—by layers, cuttings, suckers, buds, and grafts.

The small fruits are principally produced by one or other of the three modes first named; while the tree fruits are propagated by buds and grafts.

Figure 1 represents a layer of a grape, which will result in the production of one extra plant; but by layering a longer branch in a trench, and not covering until the new growth has commenced, then pressing this gently about the new shoots, and gradually filling the trench up, many more can be produced from the same layer.

Fig. 1.

The time for doing this is in the spring, before growth has commenced; or it may be done with new wood during the summer.

Fig. 2 is a cutting from a currant, inserted in the ground four-fifths of its length, ready for growth. This should be done as soon as the ground is fit to work in the spring; planted in mellow soil, which should be well packed at the base.

Fig. 2.

Suckers are offshoots from the roots, and need no illustration. Blackberries, red raspberries, and quinces are best reproduced in that way.

Budding is mostly practiced on the stone fruits—peaches, plums, nectarines, apricots; and sometimes on the apple and pear. The time for budding the former is August or early in September, according to season and latitude; though it can only be done successfully when the bark will raise freely. It consists in procuring a well-ripened bud from the branch of a tree desired to propagate from, and inserting it under the bark of a young seedling tree. The bud

must be cut from well-ripened wood of the same year's growth and it must be inserted in a stem of the same year's growth. A seedling tree — peach, for instance — should be budded near the ground, and the next season, after the bud has commenced to grow, the top of the tree should be cut off six inches above it, and when large enough, the growing shoot should be tied to it, to prevent its being broken off by the winds.

Fig. 3 is a bud as cut from a scion, with a half inch of the leaf-stem attached. This stem should always be left on, as it is convenient in holding and placing the bud under the bark.

Fig. 4 is a section of the stock, showing the cut in the bark—like a letter T—into which, by raising the edges, the bud is to be inserted.

Fig. 5 is the stock with the bud inserted. When placed, it should be tied, to hold it in its place. The material used by nurserymen for tying, is strips of bass-wood bark, cut in proper lengths. As this can not always be had by others, soft, light woolen yarn, or

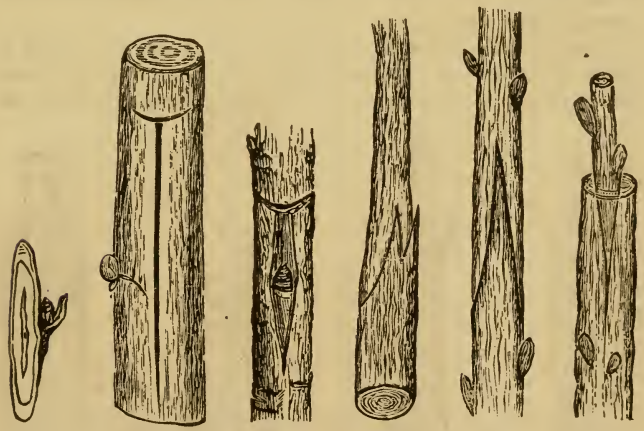


Fig. 3. Fig. 4. Fig. 5. Fig. 6. Fig. 7. Fig. 8.

narrow strips of old and thin calico, may be substituted. Care should be taken not to tie too tightly. After ten days or two weeks the ties should be cut off.

The process of budding the apple and pear is much the same, only

that it is done in June, when the buds will grow a foot or two the same season.

GRAFTING is the insertion of a scion from one tree into the wood of another. It is successfully done in the root, or at the collar, of a young seedling—or in the stem anywhere above ground—or it may be done in the branches of a large tree. By the first of these modes most of the apple trees from the nurseries are propagated. This is usually done in the winter, the scions being cut and the young trees dug up and carefully packed away in sand in cellars before the ground freezes. When grafted, they are packed in boxes in sawdust, and are ready to be transferred to the open ground as soon as it is prepared in the spring.

Grafting above ground is done in the spring before growth begins, though it can be done successfully after the buds have begun to swell; but scions should be cut earlier. It frequently is desirable —and we have elsewhere strongly advised it—to change varieties by top-grafting, even after bearing has commenced. The process is easy, if rightly understood. Trees of five, ten, and even twenty years old, have been thus changed with profit.

There are three modes of grafting practiced by nurserymen, all of which have their advantages. *Tongue Grafting* (Fig. 6) is that wherein a sort of tongue is made in the scion to be inserted in a cut

FIG. 9.

FIG. 10.

FIG. 11.

FIG. 12.

in the face of the stock. Fig. 7 represents the stock inserted, wedge fashion into the scion, called *Saddle Grafting;* and Fig. 8 gives a view of the most common and the easiest mode, called *Cleft Graft*

inq. When completed by any of these modes, the graft is to be wrapped, as in Fig, 9, with a strip of strong thin paper, saturated with grafting wax.

In grafting large limbs the modes must be adopted as represented in Figs. 10 and 11—Fig. 12 showing how the split is to be held open while the graft is inserted. These larger grafts are to be covered with wax without the paper—it being usually carried in a ball, and put on with the hands covering the whole from the weather, excepting the buds of the scion.

In top-grafting not more than one-half of the branches should be used the first year, leaving the other half to be grafted the following year. The reason for this is, that a tree must not be divested of all its foliage, a portion being necessary to sustain life.

The limbs for grafting should be selected as nearly equal as possible from all sides, and should be cut only far enough from their junction with the body or larger limbs to admit of the necessary split.

The tools necessary for this work are, a sharp pruning saw, a good, strong-bladed knife, a mallet, and a small, thin iron wedge—all in a basket for convenience, with scions and a ball of wax.

In placing the scions to their places in the stock, care must be taken that the outer bark of one shall just meet the other; also that the wedge of the graft is cut sufficiently slanting to fit the split closely. It is desirable, also, that where the limb is large enough to justify it, there should be two grafts inserted, to insure against loss.

Some varieties are much more vigorous growers than others. Care should be taken that, in the selection of grafts, those sorts that are near equal in that respect should be joined together. Free growers should not be grafted upon stocks of slow growth. Grafts that have been well set will sometimes make a growth of several feet during the first season. The scions to be used should be about four inches in length and may have three buds, one of which should be placed just at the entrance of the split, as in the figure.

Grafting wax is made of about equal parts of resin, beeswax, and tallow, melted together. The proportions are varied to suit the weather.

There are many modes of grafting and budding not alluded to here, as these are sufficient for most purposes and are the simplest and most easily put in practice. Much is necessarily left unexplained, which the good sense of the reader, added to a little experience, will supply.

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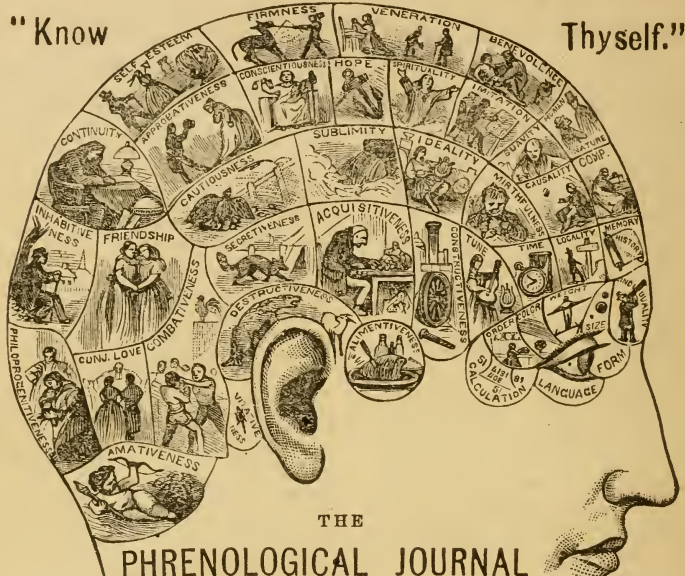

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